EuroTech
COMMUNICATION

MULTI-CELL

PRI to Cellular Gateway User Guide

CONTENTS

1. INTRODUCTION 3
   1.1. The ISDN PRI Gateway Solution Overview 3
   1.2. About this Manual 3
   1.3. Terminology 3
2. GETTING STARTED 4
3. CHECK YOUR PACKAGE ITEMS 5
   3.1. Connecting the Cables 5
4. INSTALLING THE MANAGEMENT APPLICATION 7
5. BASIC CONFIGURATIONS WITH THE MANAGEMENT APPLICATION 10
   5.1.1. Connecting the Management Computer via RS-232 Serial Connection 11
   5.1.2. Connecting the Management Computer via Ethernet Interface Connection 11
   5.1.3. Setting Date, Time and Password 13
6. CONFIGURING ISDN CONNECTION SETTINGS 14
7. MONITORING CALLS 17
8. OPERATIONAL TEST 21
9. ADVANCED CONFIGURATION 24
   9.1. Defining Groups of Ports 24
10. PORT AND SIM CONFIGURATION 26
   10.1. Configuring B-Channels, Ports and Prefixes 27
      10.1.1. Assigning B-Channels to Dial Numbers 31
      10.1.2. Access to GSM & Access to E1 32
   10.2. Defining the Work Mode for Ports 34
   10.3. Configuring SIM Card Settings 38
      10.3.1. Defining the Type of Channel and Operation Lock 39
      10.3.2. Setting Time Table for SIM 39
11. GENERATING CALL REPORTS 41
12. TCP/IP SETTING 43
13. TROUBLESHOOTING AND KNOWN ISSUES 45
   13.1. The RJ-11 Handset 45
   13.2. The Management Application Debug Window 45
14. FAQ 47

1. INTRODUCTION

Eurotech Communication Ltd is glad you have chosen to use the Multi-Cell ISDN PRI Gateway.

We are confident, due to the quality of our product, simplicity of use and excellent customer support, that this Gateway will meet your communication needs and will help you save money on your office/mobile phone calls.

The goal of our experienced team of engineers, who develop and produce our products, is to meet the growing demands of our customers in today's communications world.

We hope you enjoy using the Gateway and appreciate any comments you may have as we always strive to improve our products and personal service for all of our customers.

1.1. THE ISDN PRI GATEWAY SOLUTION OVERVIEW

The Multi-Cell ISDN PRI 32ch /32 SIM or 32ch/128 SIM Gateway, or Multi-Cell PRI for short, can connect ISDN calls to cellular networks (CDMA ׀ GSM ׀ UMTS).

The Multi-Cell PRI has up to 32 SIM ports and works with 30 simultaneous calls (1 X E1).

Each cellular port has one or four local SIMs.

This is a heavy duty Gateway and can work with over 1,000,000 call minutes a month.

The Multi-Cell PRI can be linked with our ISDN/VoIP Media Gateway, giving a direct call from ISDN to VoIP.

1.2. ABOUT THIS MANUAL

This manual provides instructions on how to use the Multi-Cell ISDN PRI 32ch/32 SIM or 32ch/128SIM – Corporate, Enterprise and heavy duty traffic.

1.3. TERMINOLOGY

The following is a list of important terms used in this manual and their definitions:

- **Gateway** – A Multi-Cell PRI unit with cellular ports.
- **SIM** – SIM card or chip
- **Master card** – A card that controls the operation of the
- **E1**- an ISDN connection card
- **Port** (ch) – A port is single channel that can send call(s).
- **Cellular Card (Slave card)** – A card with cellular ports (modules).
- **VoIP** – A protocol for transmitting voice calls on Ethernet networks.
- **SIM Registration** – The activation of the SIM in a cellular network. The SIM must be registered to make calls.

2. GETTING STARTED

This section explains the **Mandatory steps** for installation, basic configuration, and test call, with a short explanation on each stage.

3. CHECK YOUR PACKAGE ITEMS

Please verify that your package contains the following components before installation:

- Main hardware device - The Multi-Cell Gateway
- 110/220V power supply cable
- Software Installation CD - Installation kit of the PRI Management MS-Windows Application, this user manual file and additional auxiliary utilities.
- 8 cellular antennas - Large size
- RJ-11 phone handset - For testing voice calls from different ports
- RJ-45 - RS-232 serial connection cable - These are referred to as COM PORT cable in this manual.
- 4 additional cables
- RJ-45 ISDN E1 cross connect cable

For direct ISDN E1 connection without intermediate PBX

- RJ-45 ISDN E1 regular connection cable

For ISDN E1 connection to a PBX

- RJ-45 Ethernet cross connect cable

For direct IP connection to a PC first time

- RJ-45 Ethernet regular connection cable

For connection to the Multi-Cell through IP

Note: The ground cable is not supplied as it is very common, low cost and various types apply.

3.1. CONNECTING THE CABLES

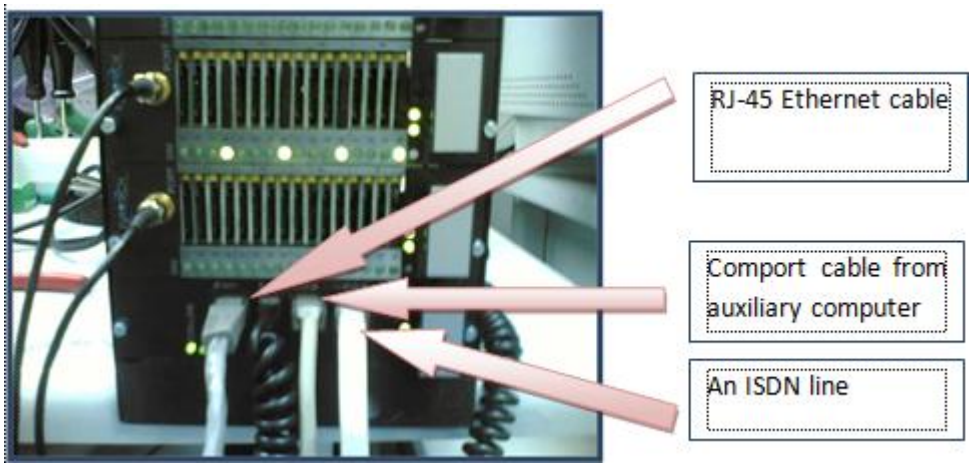
There are several cables to connect to the Multi-Cell PRI Gateway. Some are mandatory and some are optional, based on the specific usage.

Note: In the following chapters, the term "switching equipment" is used to refer to any Multi-Cell PRI equipment connected to the ISDN connector in the Multi-Cell Gateway.

Basic Connections

- **Power cable 110/220V** - The power cable is supplied and should cover all main voltage electricity services in the world. However, you should check that the cable plug is suitable with your country's outlet socket. Connect a 120 V (North America), or 240 V (Europe) power supply cable to the Multi-Cell Gateway.
- **ISDN cable** - The regular ISDN cable is used to connect the system to the PBX, serving the office landline phones. For the regular ISDN cable, connect the ISDN line from the telephone switching unit in your office to the Multi-Cell unit. Connect the ISDN line to the socket labeled **ISDN** in the Multi-Cell unit, as shown below.

- **COM port cable** - This cable is used between the Management Application PC via **RS-232 serial COM** port and **RJ-45** connected the **COM** socket in the Multi-Cell PRI Gateway unit. This connection is recommended for first time setting.
- **RJ-45 Ethernet cable** - The regular RJ-45 Ethernet cable is used for connection between PC with the PRI Management Application and the Multi-Cell PRI system via IP. This is an additional option which can be used to connect the Management Application PC to the system and it has the benefit of enabling operating management of configuration, monitoring and reporting from any location where the Multi-Cell PRI system IP is known.



After you have connected the cables properly, Power on the Multi-Cell PRI Gateway.

Additional cables:

- **RJ-45 ISDN E1 Cross cable -** Used in the same case as the regular ISDN E1 cable depends on the ISDN settings.
- **RJ-45 Ethernet cross cable -** Used for direct IP connection to a PC, in order to set the initial IP settings of the Multi-Cell Gateway system.

4. INSTALLING THE MANAGEMENT APPLICATION

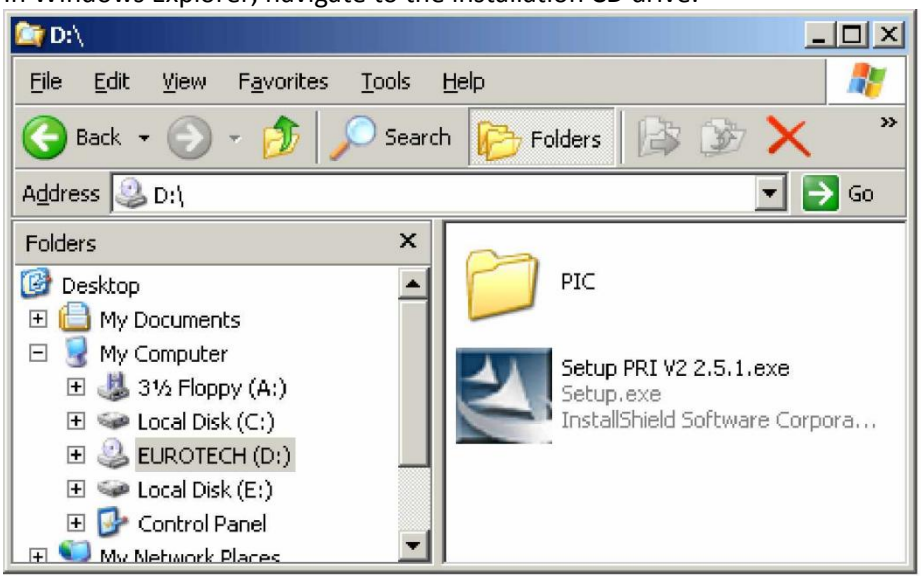
The PRI Management MS-Windows Application provides the following functions:

- **Configuration** - Connections, ports, channels, SIM cards and operational modes can be configured.
- **Monitoring** - Call operations can be monitored from the Management Application. Therefore you may wish to leave a computer permanently connected to the Multi-Cell PRI system at all times.
- **Reports and statistics** - Call reports, calls history, antenna reception, status logs and more, can be generated for analysis in standard MS-Windows data processing tools such as MS-ACCESS and MS-EXCEL.

Before operation, configuration settings must be made to the Gateway. Configuration is done in an auxiliary computer with the PRI Management MS-Windows Application provided for MS-Windows operating system.

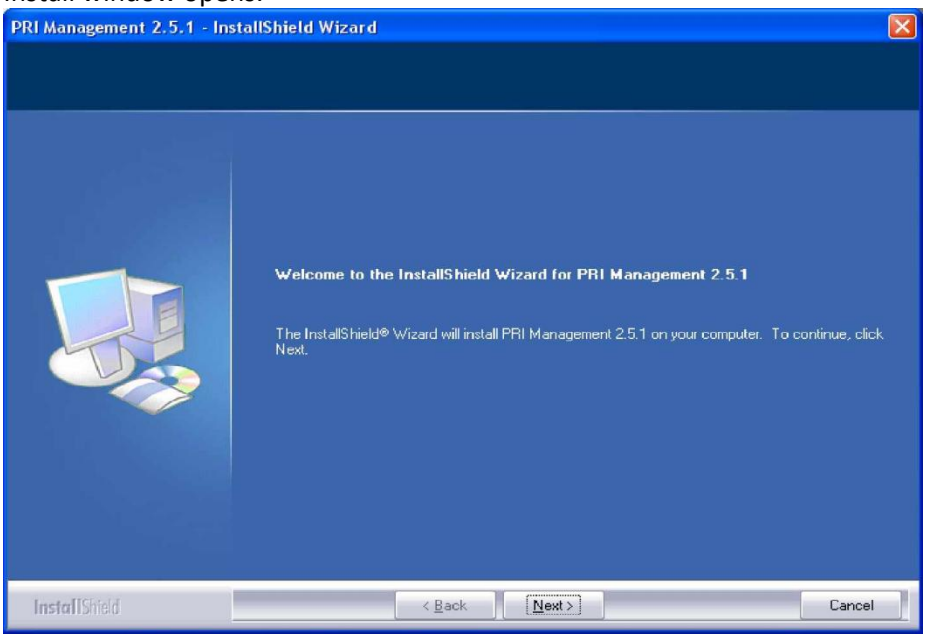
To install the PRI Management application on your PC:

1) Insert the Multi-Cell compact disk into the CD drive of the configuration computer.
2) In Windows Explorer, navigate to the installation CD drive.



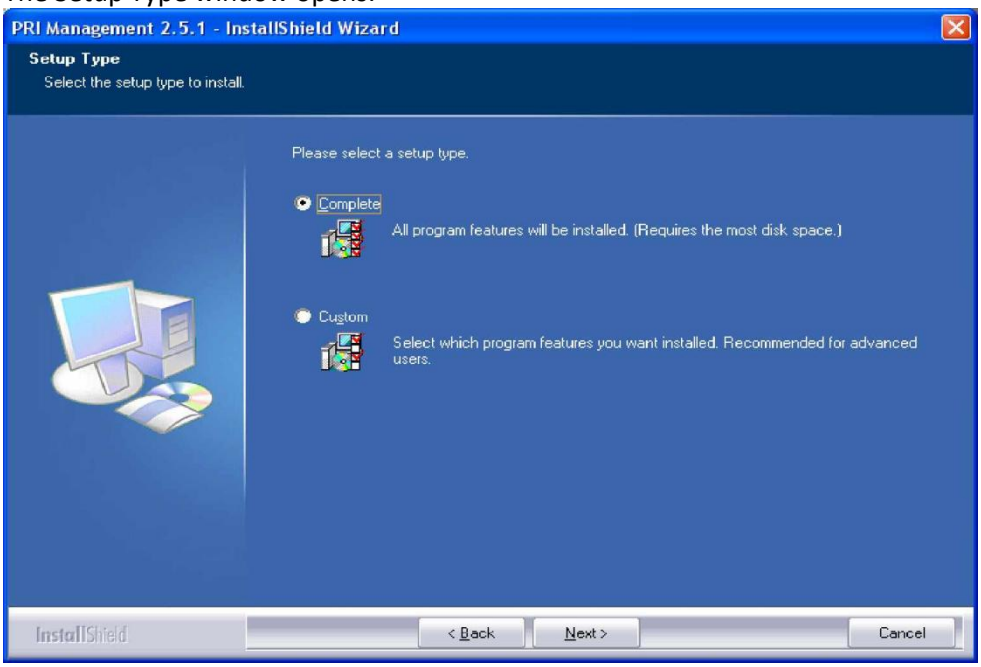
3) Double click

to install the Multi-Cell Management Application. The Install window opens.

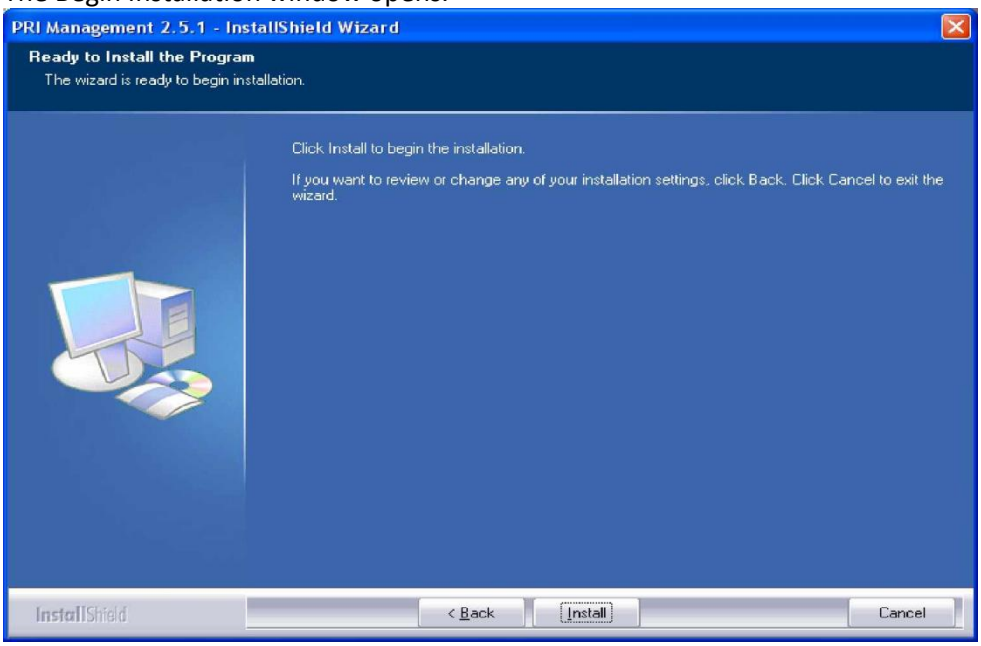

PRI Management 2.5.1 - InstallShield Wizard
Welcome to the InstallShield Wizard for PRI Management 2.5.1
The InstallShield® Wizard will install PRI Management 2.5.1 on your computer. To continue, click Next.
InstallShield
< Back
Next >
Cancel

4) Click Next.

5) The Setup Type window opens.


PRI Management 2.5.1 - InstallShield Wizard
Setup Type
Select the setup type to install.
Please select a setup type.
Complete
All program features will be installed. (Requires the most disk space.)
Custom
Select which program features you want installed. Recommended for advanced users.
InstallShield
< Back
Next >
Cancel

6) Select Complete and click next.
The Begin Installation window opens.


PRI Management 2.5.1 - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

7) Click Install. The PRI Management Application installs itself. Wait until the completion message appears.

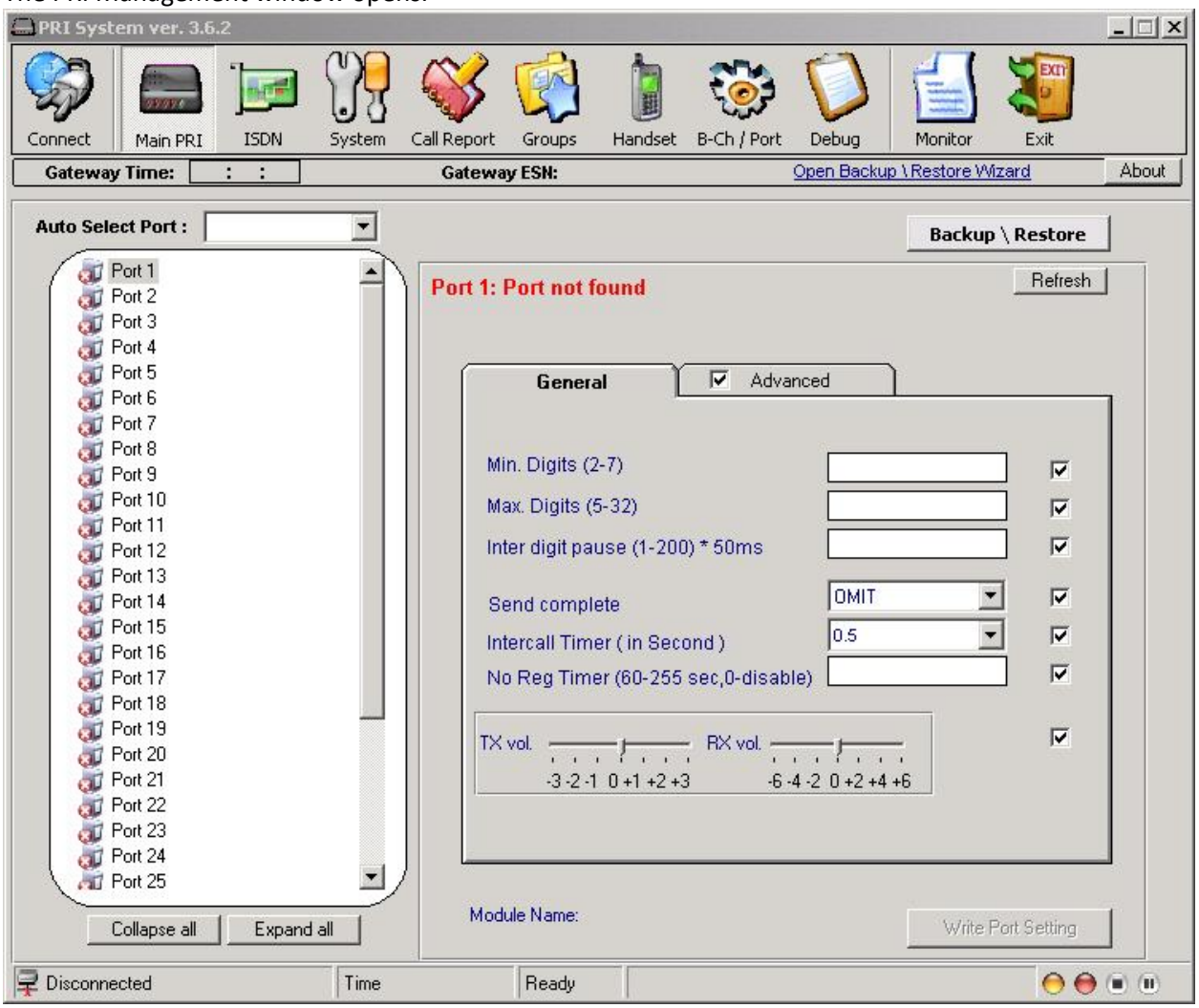
5. BASIC CONFIGURATIONS WITH THE MANAGEMENT APPLICATION

After installing the Management Application, launch it and define the type of connection between the auxiliary computer and the Multi-Cell as described below:

- ***To define the connection type:***

8) Launch the PRI Management by clicking

on your computer desktop, or by selecting: **Start > Programs > Eurotech Communication > PRI Management.**
The PRI Management window opens.



9) On the Main toolbar, click **Connect.**
The Select Connection window opens.

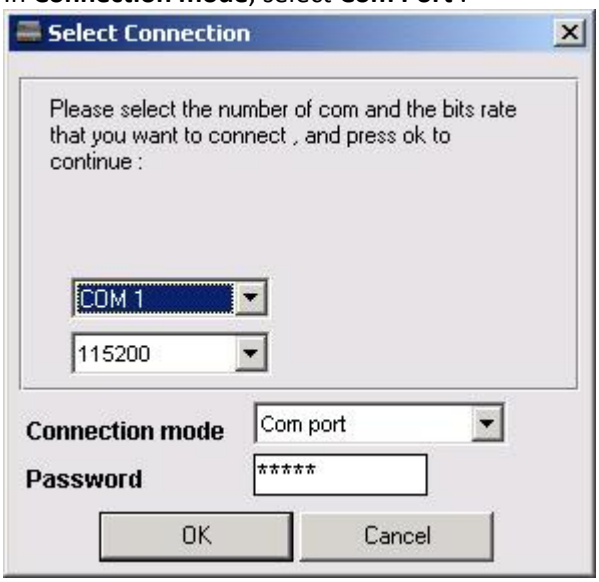
10) The configuration computer can be connected to the Multi-Cell in two ways:

- via the serial RS-232 cable (See ***Connecting the Management Computer via RS-232 Serial Connection*** on page 11.)
- via the Ethernet interface. (See ***Connecting the Management Computer via Ethernet Interface Connection*** on page 11.)

5.1.1. CONNECTING THE MANAGEMENT COMPUTER VIA RS-232 SERIAL CONNECTION

To connect the Management computer via RS-232 Serial connection:

1) Connect the RS-232 cable from an available communication port in the computer to the Com socket in the Multi-Cell Gateway. This is the default setting.
2) In **Connection mode**, select **Com Port** .



3) In the selection pull down menu, select the computer Com Port number that you are using for your RS-232 connection with the Multi-Cell PRI Gateway.
4) In **Bits per second** define 115200.
The default Password is **admin**.

5.1.2. CONNECTING THE MANAGEMENT COMPUTER VIA ETHERNET INTERFACE CONNECTION

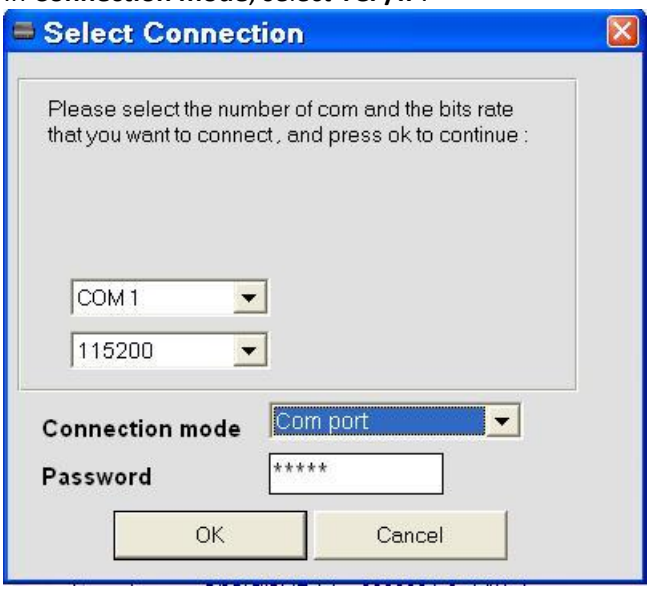
This option enables a TCP/IP Internet connection via the "NET" socket (RJ-45) on the Multi-Cell PRI Gateway.

To connect the cables, see ***Connecting the Cables*** on page 5.

For TCP/IP settings of the Multi-Cell PRI Gateway, see ***TCP/IP Setting*** on page 43.

To connect the Management computer via the Ethernet interface:

1) In C**onnection mode**, select **TCP/IP**.

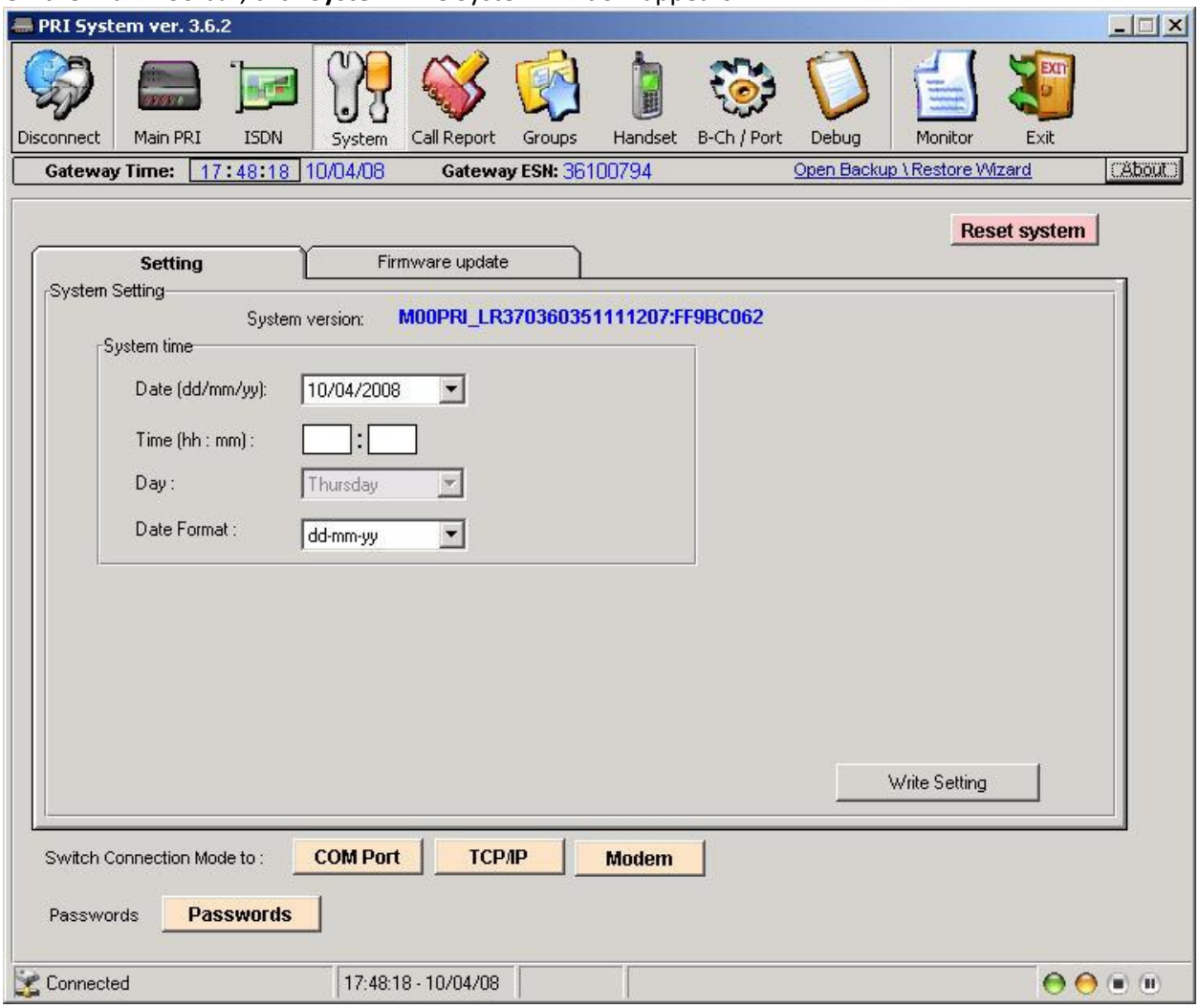


2) Define the following:
   - Host address (the IP of the Multi-Cell that you set).
   - Enter 4001 as the IP Port number to be used for the Manager Communication session.
   - The default Password: admin.
3) Click **OK**.

5.1.3. SETTING DATE, TIME AND PASSWORD

To set the date, time and pasword:

1) On the Main Toolbar, click **System**. The System window appears:



2) In the **Setting** tab, define the Date, Time and Date format.
3) Click **Write Setting** to apply the definitions.

Note: If you have both NET and COM port cables connected to the Multi-Cell and you are connected through one of these interfaces to the PC software, you can switch the connection to the other interface by clicking **Switch Connection Mode to** and selecting another interface.

After switching interfaces, you must reconnect using the new interface.

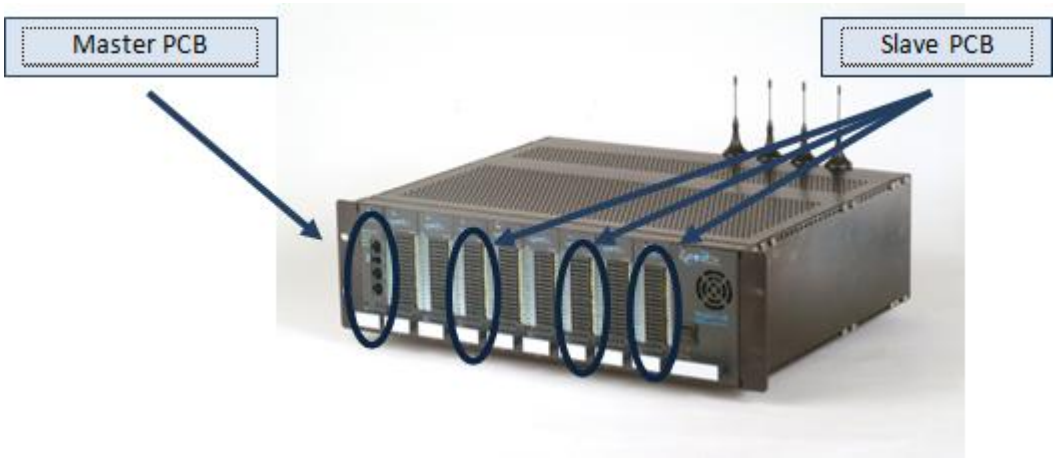
4) Click **Passwords** to change the default password (admin).
   You can set a password for **User** and limit the configuration permissions.

Note: Updating the firmware can be done via a Com connection or remotely via the Net connection. For upgrading the Multi-Cell with a new firmware, please contact Eurotech support.

6. CONFIGURING ISDN CONNECTION SETTINGS

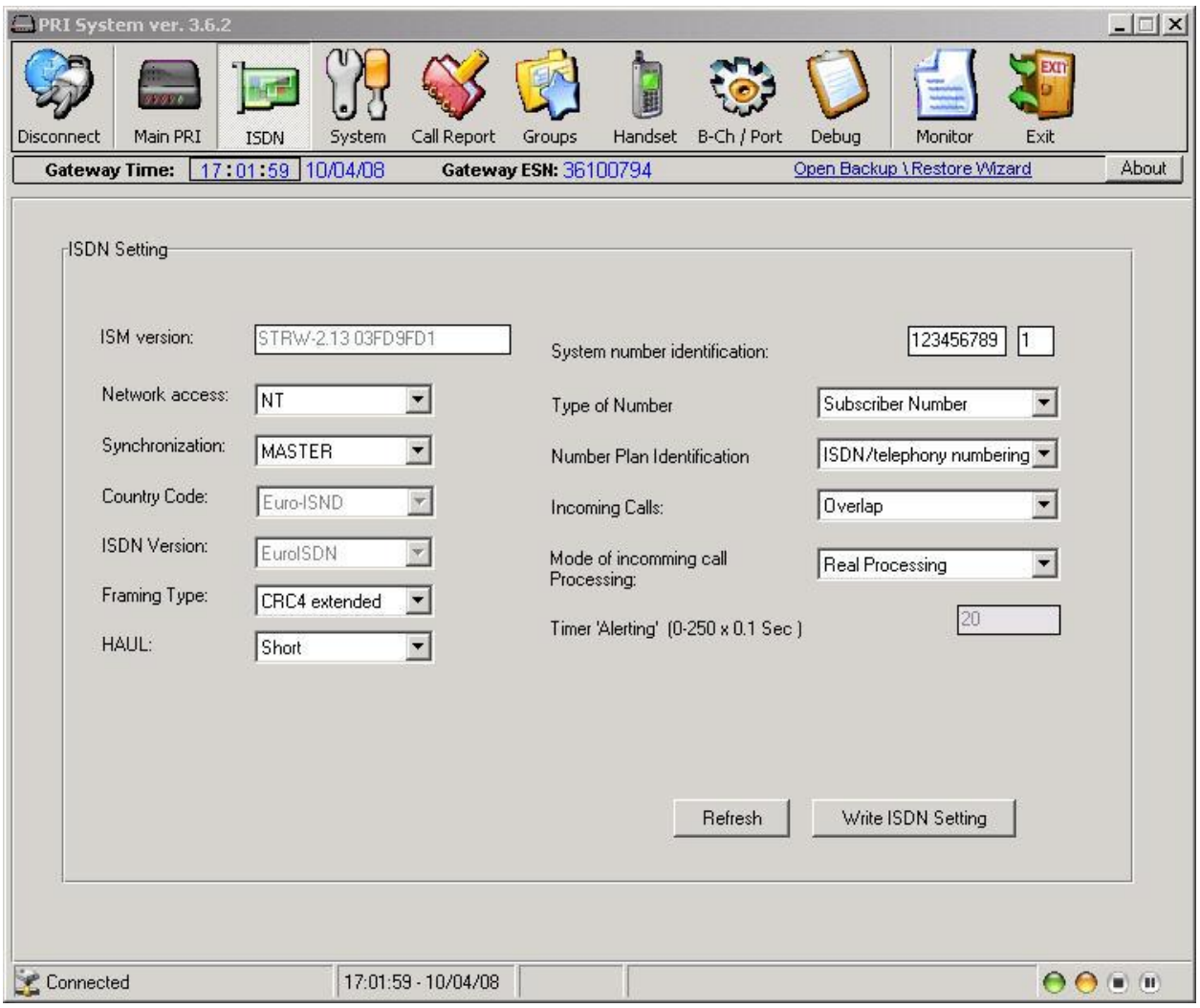
This section describes how to configure the ISDN settings.

Each Multi-Cell Gateway has a master Printed Circuit Board (PCB). The ISDN card is a small PCB mounted on the master PCB. The ISDN card is between ports in the Multi-Cell and the switching unit.



- ***To define ISDN settings:***

I) On the Main Tollbar, clilck **ISDN**.
The ISDN window appears.



This window defines settings in the E1 line, between the switching unit and the ISDN card.

2) Define the following:

Note: Ensure that settings are in conformity with settings in the switching unit.

- Set **Network access** as NT, (set the switching unit as TE).
- In **Synchronization**, define the Master/Slave status. It is preferable to define the Multi-Cell unit as the Master, and the switching unit as the slave.
- In **Incoming Calls**, select the interface of incoming calls (from the switching unit to the ISDN card), **Overlap** (pulse) or **In Block** (packet) in conformity with the setting in the switching unit.
- In **Type of Numbe**r, select the type of number (TON) of calls (from the ISDN card to the switching unit), as defined in the switching unit.
- In **Number Plan Identification**, define the protocol numbers from the ISDN card to the switching unit. Set this parameter as defined in the switching unit.
- In **System** number identification, enter your Local Number and Local Sub address.
- In **Mode of incoming call processing,** select either:

- **Real Processing** to translate Cellular alert event to ISDN alert event.

- **Imitation Processing** to produce **ISDN alert event** in the software;then enter a time value in **Timer Alerting**.

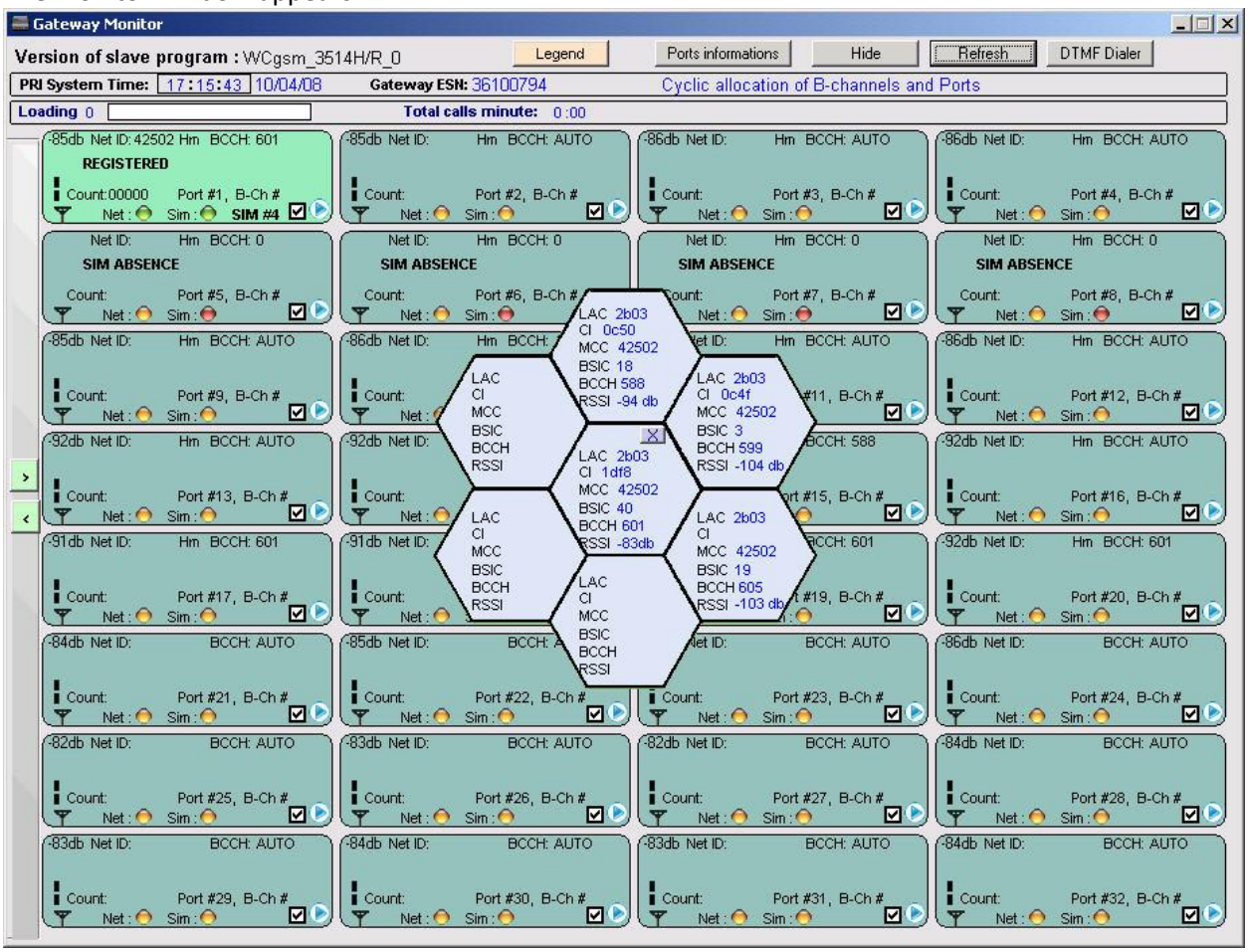
l) Click **Write ISDN Setting** to send the ISDN settings to the Multi-Cell unit.

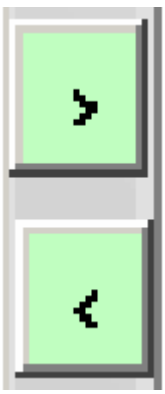
7. MONITORING CALLS

This section describes how to monitor calls and review reports.

To monitor calls:

1) On the Main Toolbar, click Monitor.
   The monitor window appears:

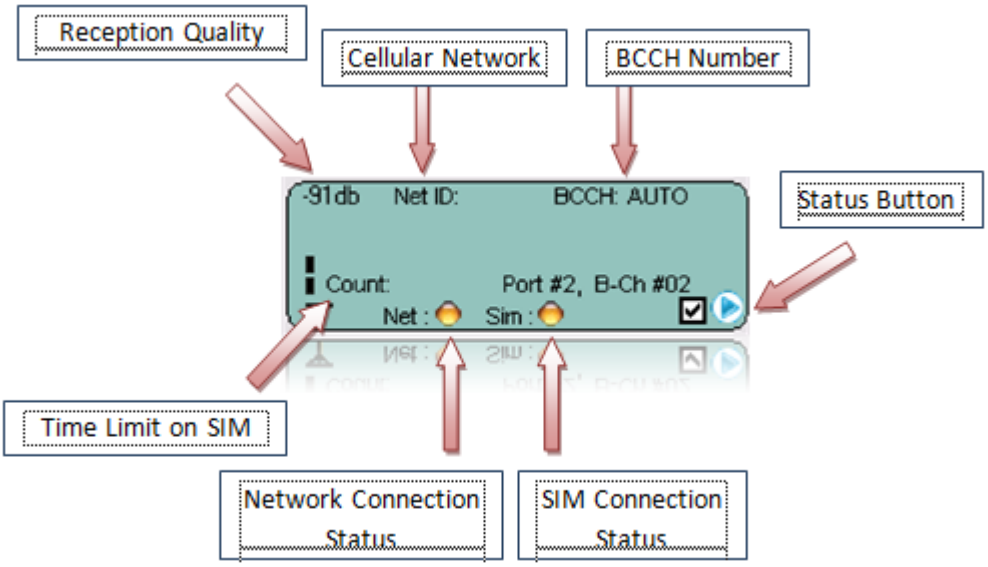

Gateway Monitor
Version of slave program : WCgsm_3514H/R_0
Legend
Ports informations
Hide
Refresh
DTMF Dialer
PRI System Time: 17:15:43 10/04/08
Gateway ESN: 36100794
Cyclic allocation of B-channels and Ports
Loading 0
Total calls minute: 0:00
REGISTERED
SIM ABSENCE
LAC 2b03 CI 0c50 MCC 42502 BSIC 18 BCCH 588 RSSI -94 db
LAC 2b03 CI 0c4f MCC 42502 BSIC 3 BCCH 599 RSSI -104 db
LAC 2b03 CI 1df8 MCC 42502 BSIC 40 BCCH 601 RSSI -83db
LAC 2b03 CI MCC 42502 BSIC 19 BCCH 605 RSSI -103 db



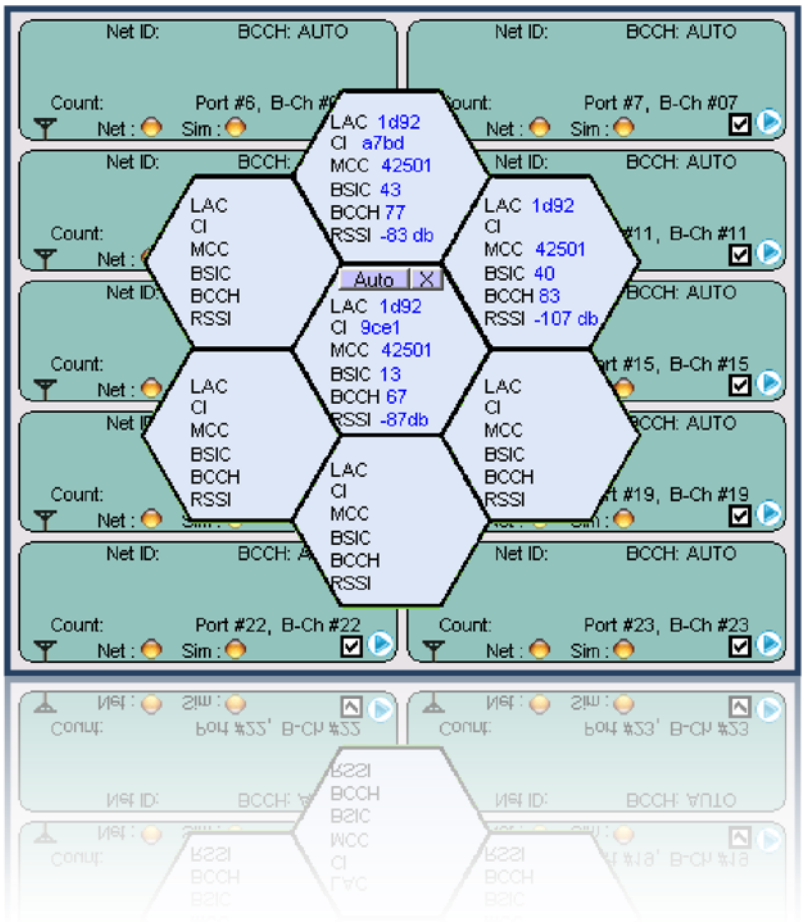
2) On the left side, click to hide or view the B-channel status, as well as the status of the following connections:
   - COM PORT

- Network
- ISDN

A red LED indicates there is no connection. A yellow LED indicates there is a connection, but no data transfer. A green LED indicates transfer of data.



3) Click the **Status button** and select **Get Cell Information.**



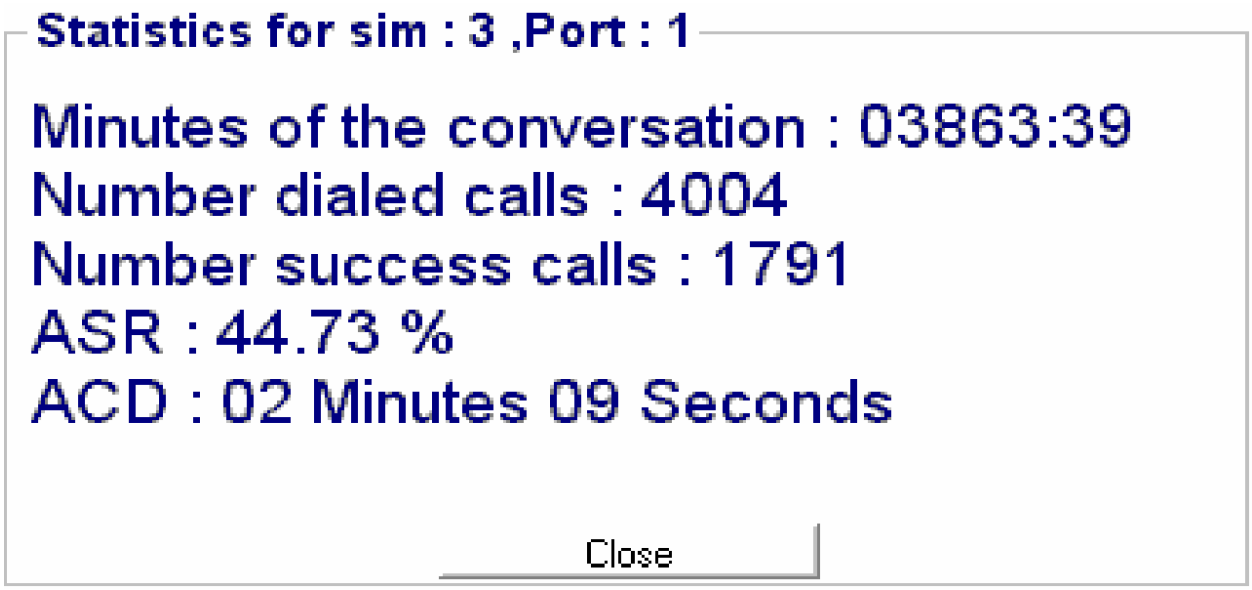
Each cell has the following information:

- LAC - Location Area Code
- CI - Cell ID
- MCC - Mobile Country Code
- BSIC - Basic Station Identity Code
- BCCH - Broadcast Control Channel
- RSSI - Receiver Signal Strength

4) Click **Status button** to view the following additional options:

- Enable/Disable Port - Choose to enable, or disable the current port
- Refresh Port - refresh the current port
- DTMF Dialer - Engage the built in DTMF dialer, allows sending DTMF signals
- Get Cell Information - Choose this to get cell information, described above
- Reset Ports X,X - Reset the ports specified in X
- Reset Statistics - Choose the SIM you want to reset statistics for
- Read Statistics - Choose the SIM you want to read statistics from

SIM Statistics:


Statistics for sim : 3 ,Port : 1
Minutes of the conversation : 03863:39
Number dialed calls : 4004
Number success calls : 1791
ASR : 44.73 %
ACD : 02 Minutes 09 Seconds
Close

- Minutes of the conversation - Total call minutes, accumulated on current SIM
- Number dialed calls - Total number of calls made via the current SIM
- Number success calls - Number of successful calls made via the current SIM
- ASR - The percentage of successful calls
- ACD - Average Time of total calls made via the SIM

8. OPERATIONAL TEST

From a PSTN Office phone attached to a PBX / VoIP Gateway try to make a call to a defined cellular cell phone in the cellular network around you.

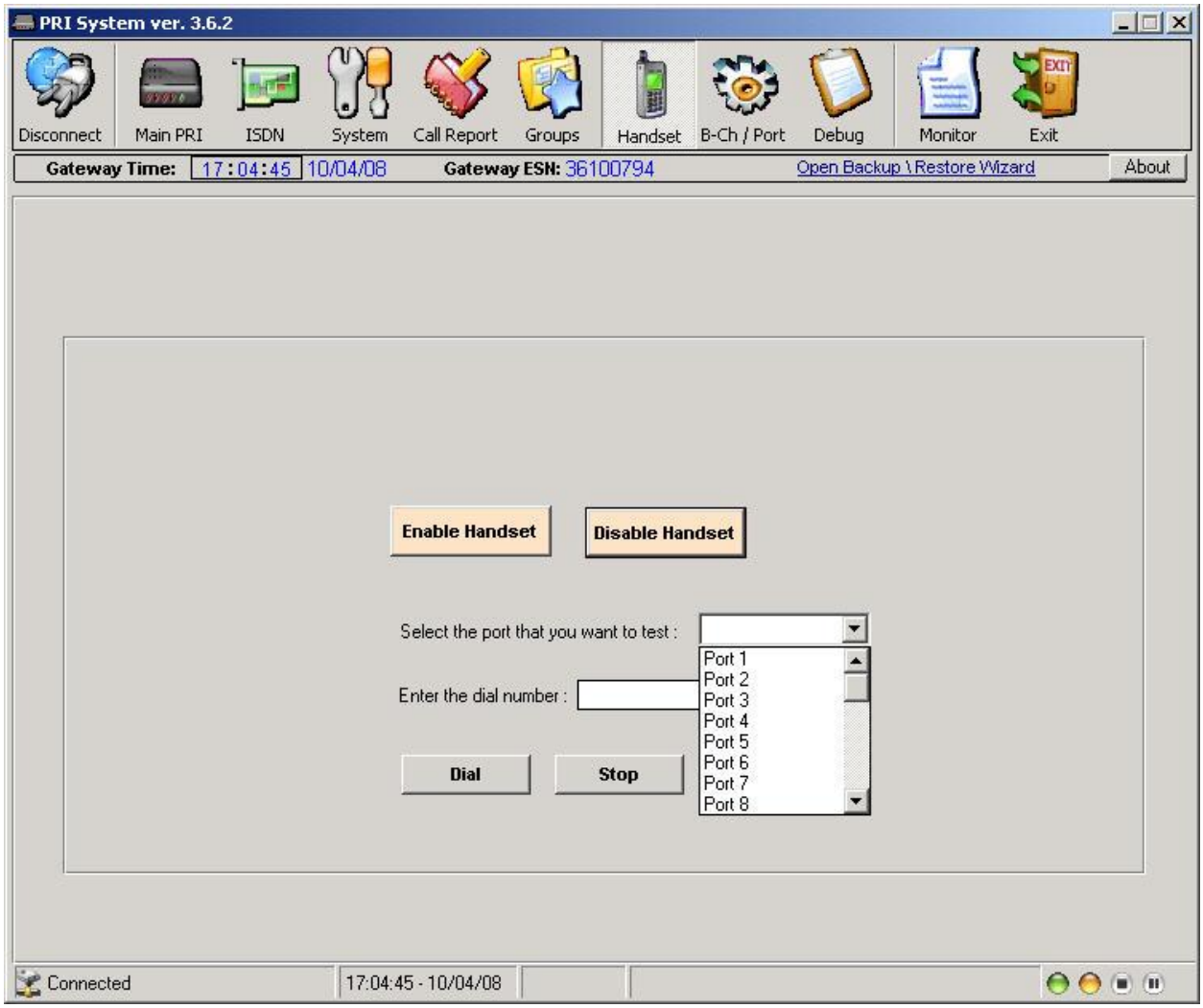
In case of a failure, verify the following:

- The Multi-Cell PRI is configured properly to your PBX / VoIP gateway.
- The connection is properly attached and not disconnected.
- The cable itself is not malfunctioning.

If your verifications did not have any results, it might be that the cellular module is not compatible with the cellular network around you.

Make the following handset test, which is mainly used to check the operation and compatibility of the Multi-Cell system with the local cellular network. Use the handset with a **RJ-11** connection that is supplied with the unit and plug it to the **HS** socket in the Multi-Cell Gateway. Follow the handset test instruction as follows:

1) Click **Handset**. The next screen will appear:



2) Click the **Enable Handset** Button to enable handset operating mode.
3) Choose the port number that you want to test from the drop down menu "**Select the port that you want to test:**"
4) Enter the desired phone number to be dialed in the field named "**Enter the dial number:**" and click the "**Dial**" button below. In few seconds the cellular phone shall start ringing and after the call is accepted, check that the voice call operates properly between the attached RJ-11 handset and the called cellular mobile phone.

In case of failure, possible causes are:

- The cellular network signal is too low.
- The cellular modules are not compatible with the mobile network around you.
- The SIM installed is not compatible with the Multi-Cell system.

Note: We are using SIM of 3V only (5V SIMs or other voltage will not work).

- The SIM card used requires a pin code.

In case you still have errors to operate the system, it is recommended to review the ***Getting Started*** on page 4 tasks and make sure you did follow the instructions properly. If you still have problems, please refer to.

9. ADVANCED CONFIGURATION

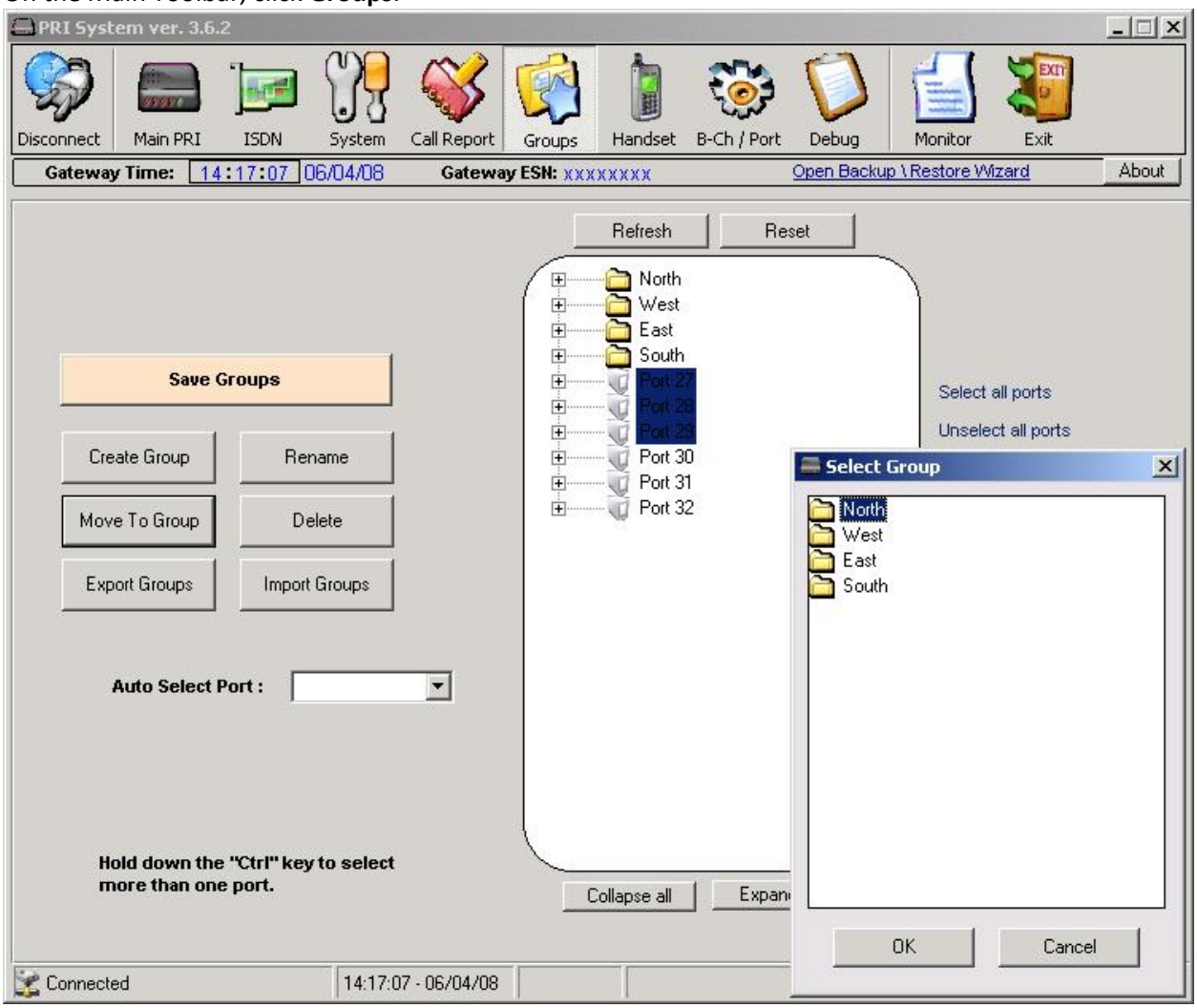
This section provides information and instructions to make advanced configurations, including:

- ***Defining Groups of Ports*** on page 24
- ***Port and SIM Configuration*** on page 26
- ***Access to GSM & Access to E1*** on page 32
- ***Configuring SIM Card Settings*** on page 38
- ***Configuring SIM Card Settings*** on page 38

9.1. DEFINING GROUPS OF PORTS

The Multi-Cell PRI unit is a gateway for 30 telephones. Telephones may be divided into Groups. For example, each department in your office may have different call patterns. Each port represents one telephone. Define settings for group of ports as follows.

1) On the Main Toolbar, click **Groups**.



2) Click **Create Group**. A new group appears at the bottom of the port list.
3) Type a name for the new group and click outside the selected area. A Group can be renamed by selecting it and clicking **Rename**.
4) Define the ports in each group:
   a. Select ports (hold the Ctrl key to choose more then 1 port).
   b. Click **Move to Group**. The Select Group window opens.
   c. Select the desired group for the ports you just highlighted.
5) Click **Save Groups** in order to send the group configuration to the Multi-Cell unit.

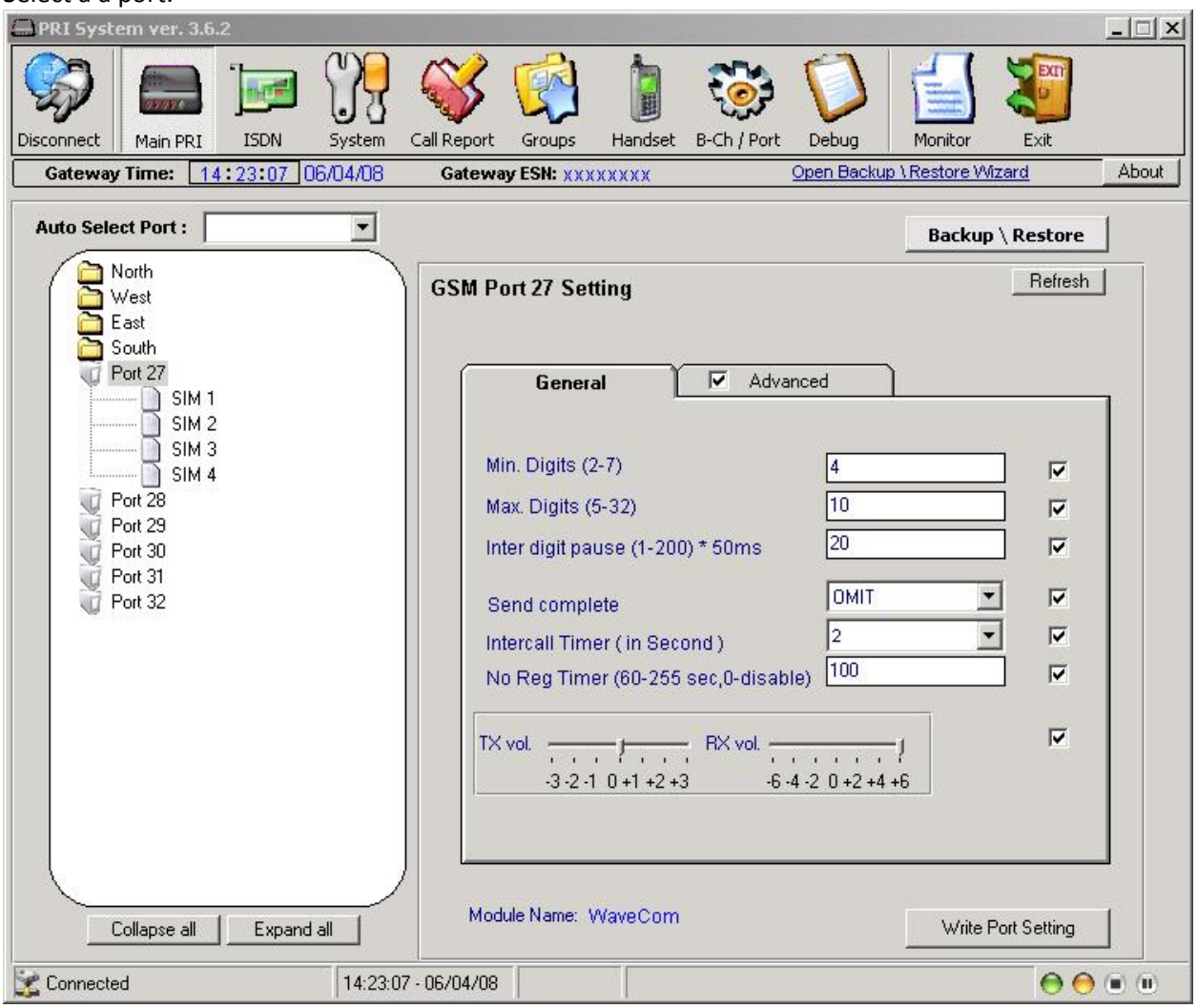
After defining groups, set time table, make dial settings and define channel locks. See ***Configuring SIM Card Settings*** on page 38.

10. PORT AND SIM CONFIGURATION

This section details port dial settings, as well as time table and channel lock for SIMs.

To define Dial Settings for each Port:

1) On the Main Toolbar, click **Main PRI.** The Port Setting window opens.
2) Select a a port.



3) Select the mode in which telephone numbers are dispatched to the cellular network.
   - To dispatch phone numbers manually, in the **Send Complete** list, select **HASH** mode. In this mode, after the user has dialed all digits of a phone number, click **#** to send the phone number.
   - To dispatch phone numbers automatically, in the **Send Complete** list, select **OMIT**. Then set three additional parameters:

   a. Length of phone numbers that will be dialed from the port within range.
   In **Min. Digits**, enter the number of digits of the shortest phone number that will be dialed from this port.

In **Max. Digits**, enter the number of digits of the longest phone number that will be dialed from this port.

b. **Inter Digit Pause -** This parameter defines a waiting time, after a digit is pressed, before the number is automatically dispatched to the cellular network.
The Inter Digit Pause is activated after the minimum number of digits have been dialed.
In many situations, two or three seconds may be appropriate for this parameter. Each unit of this parameter is 50 milliseconds. For example, to set an inter digit pause of 3 seconds, enter a value of 60 in this box (60 * 50 milliseconds = 3,000 milliseconds = 3 seconds).
When a port is set to auto-dispatch phone numbers, after the user has dialed the maximum number of digits, or, when an inter digit pause has occurred, then the number is dispatched automatically.
Note the following:

- If this parameter is set too low, then incomplete phone numbers may be dispatched if the user pauses briefly while dialing.
- If this parameter is set too high, then users would have to wait a long time before a number is dispatched.

a. Define minimum amount of time between outgoing calls.
Enter the minimum amount of time between outgoing calls in the Intercall Timer box. Set this parameter according to limitations of the cellular network. In many situations, two seconds may be an appropriate value for this parameter.

1) In the TX vol. and RX vol. adjust the volume for each port.

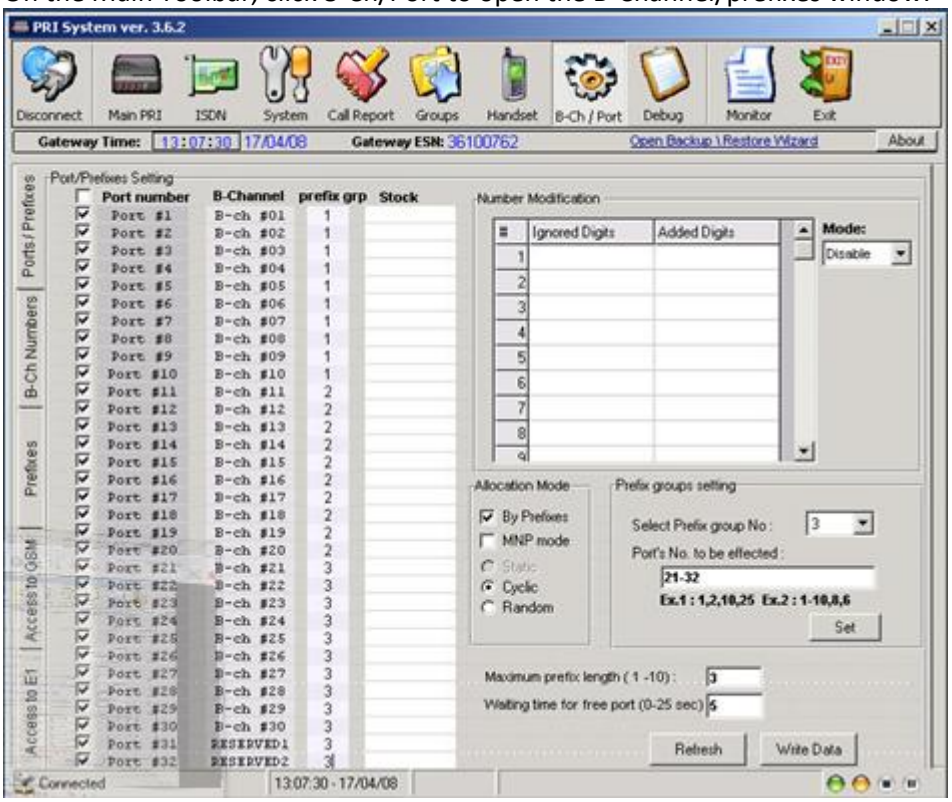
2) After making port settings, click **Write Port Setting** to send the settings to the Multi-Cell unit.

10.1. CONFIGURING B-CHANNELS, PORTS AND PREFIXES

This section explains how to assign B-channels to in-house phones, allocation of calls to Multi-Cell Ports, Prefixes, Access to GSM and Access to E1.

To assign Ports and define Prefixes:

I) On the Main Toolbar, click 8-Ch/Port to open the B-Channel/prefixes window.



2) Enable or disable ports in **port number** column by checking or unchecking the boxes next to the ports.

3) When using prefixes, enter group number that you assign to the port, in **prefix grp** column. See ***Defining Groups of Ports*** on page 24.

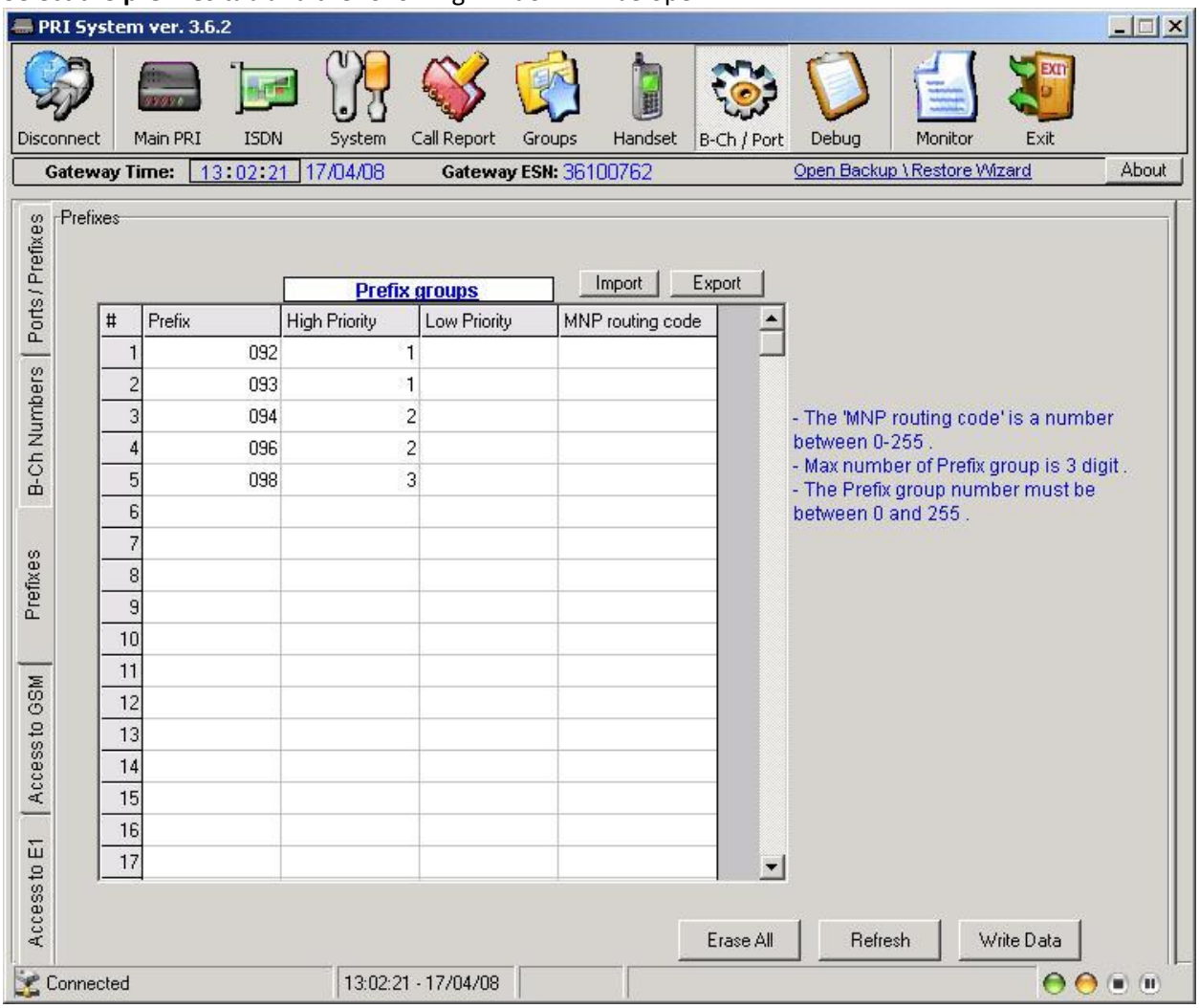
4) Define the folowing:

- **"Number modification"** – Enable or disable the table in the "Mode" drop down menu. To modify numbers received from ISDN, enter the digit/s that you want to ignore in "Ignored Digits". The digit/s that you want to add, enter in "Added Digits". For instance, when the PBX sends the number **0012345678** and you need to change it to **0412345678**; you should enter in "Ignore Digits" 00, and in "Added Digits" enter 04.
- **"Allocation Mode"** – When using prefixes, mark the box "By Prefixes" and the option "MNP mode" will be available. MNP is abbreviation for mobile number portability, using this feature requires you to supply the data base for mobiles numbers on regular basis; contact Eurotech for further information about this feature.
- **Static** – Each B-channel is assigned to a specific port in a fixed way. The B-channel that is assigned to the port can be changed by dragging it to the "Stock" column which is used as a buffer and then placing different B-channel parallel to the same port.
- **Cyclic** – Calls originated on ISDN interface are made through ports in a cyclic way, meaning the call is directed to the following free and enabled port. The B-channels are not assigned to the ports. Calls terminated on a cellular interface are made through B-channels in a cyclic way, meaning the call is directed to the following free and enabled B-channel; The B-channels are again not assigned to the ports.

- **Random** – Calls originated on ISDN interface are made through ports randomly, meaning each call is directed to a random free and enabled port; The B-channels are not assigned to the ports. Calls terminated on a cellular interface are made trough B-channels in a random way, meaning each call is directed to a random free and enabled B-channel.
- "**Prefix groups setting"** – Enter port numbers that you want to assign to a group in the field "Port's No. to be effected"; From the drop down menu "Select Prefix group No", choose a group number to assign to the ports that you selected above, and click the "**Set**" button, then click "**Write Data**".
- **"Maximum prefix length (1-10)"** – Enter the number of digits that you want to check in the number when using prefixes.
- **"Waiting time for free port (0-25 sec)"** – When using prefixes and both "High Priority" and "Low Priority" (will be explained in the following example) are used and all the ports in these two groups are occupied with calls, the amount of seconds entered here will be the time waited before retrying to direct the call to high priority group and if all ports still busy then to low priority group. If, after trying for the second time, again both groups are occupied with calls, the call will be disconnected.

5) Click **Write Data** for changes made in this in window.

6) Select the **prefixes** tab and the following window will be open:



7) In the **prefix** column, enter the prefixes that you are using and next to each prefix in the **High Priority** column, enter the group number that includes the ports which are assigned to this prefix. The **Low Priority** column is optional and used when all ports in the High Priority group are busy.

Example for prefixes configuration (see screenshots):

In general you have to make a group for each operator that you use, for this example we use 3 operators that each one of them have one or a few prefixes.

- First operator: AAA, uses prefixes 092, 093.
- Second operator: BBB, uses prefixes 094, 096.
- Third operator: CCC, uses prefix 098.

You will have to make 3 groups and assign ports that have the same prefixes, to each group.

- Group 1 - Port 1-10 will have SIM's from operator AAA (prefixes: 092, 093).
- Group 2 - Ports 11-20 will have SIM's from operator BBB (prefixes: 094, 096).
- Group 3 - Ports 21-32 will have SIM's from operator CCC (prefixes: 098).

When a call is made, the prefix is checked and the call is directed to the group with the ports that have the SIM's with this prefix.

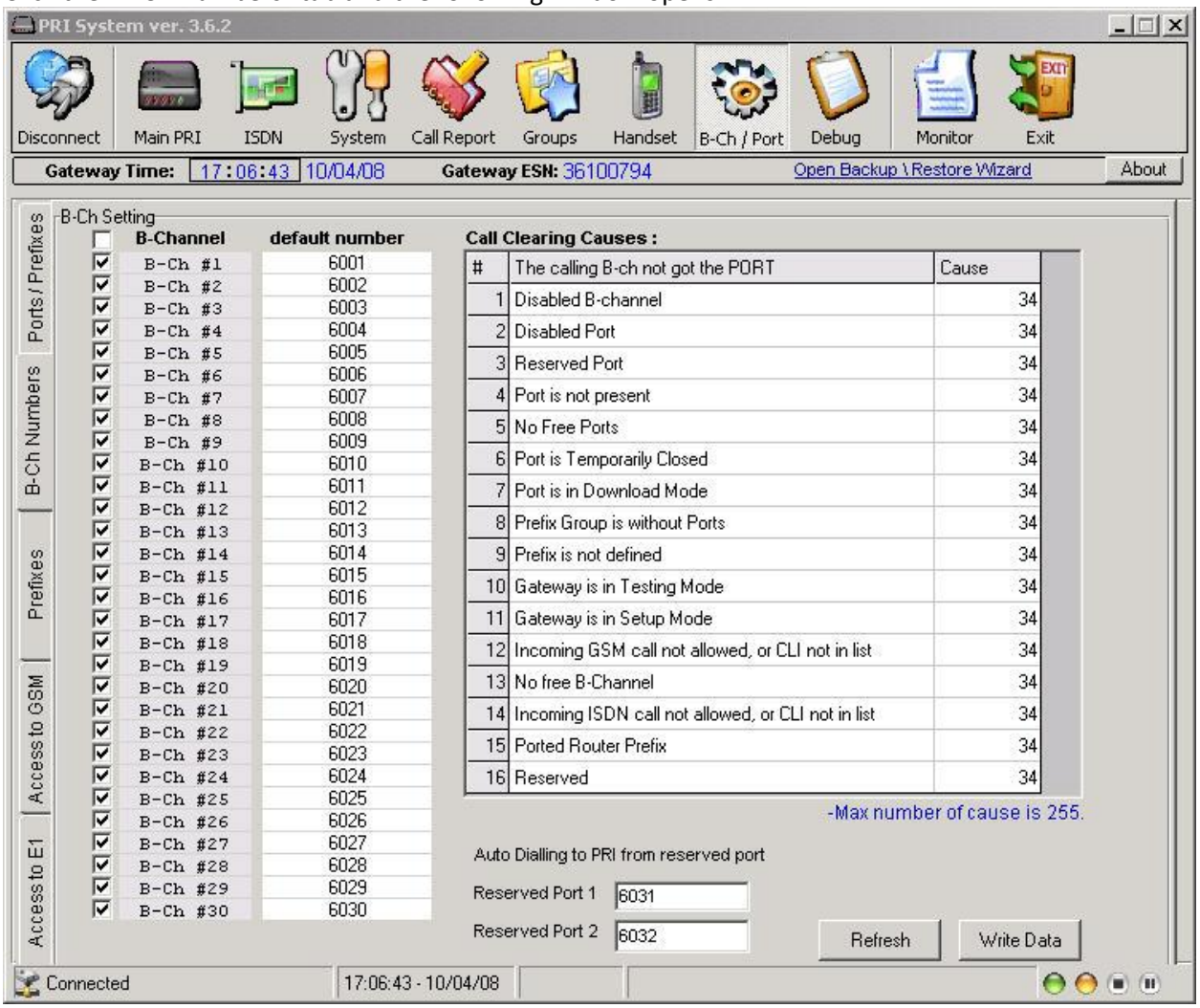
How to configure:

1) In the Multi-Cell PRI PC software, click the "B-CH/Port" icon, in allocation mode enable the "By Prefixes" box.
2) Next assign the 32 ports to their groups as explained above in point 6.
3) In the field "Maximum prefix length (1-10)", enter 3 - because the prefixes that you check have only 3 digits (092, 094 .....). In the field "Waiting time for free port (0-25 sec)", enter the number of seconds to be waited when "High Priority" and "Low Priority" groups are busy with calls before the call is directed again to those groups; explained above in point 8. Then click "Write Data", to save the changes that you have made.
4) Select the "Prefixes" tab (on the left side), enter the prefixes in the "Prefix" column (092, 093…) and the group number in the "High Priority" column (1, 2 or 3), then click "Write Data"
5) If all the ports of one group are busy with calls and you do not want to lose other calls that are coming to the same operator, you can enter in the column "Low Priority" another group number and those calls will be directed to the ports in the "Low Priority" group; the use of "Low Priority" group is optional.

10.1.1. ASSIGNING B-CHANNELS TO DIAL NUMBERS

To assign B-Channels to dial numbers:

I) Click the "B-Ch Numbers" tab and the following window opens:



2) Mark the **B-Ch setting** in order to activate all B-channels. Unmark a B-channel to deactivate it.
3) In the default number column, for each B-channel enter a number that identifies it to the PBX or the ISDN switching unit.
4) In the table "Call Clearing Causes" there are a variety of disconnection causes. The number that is assigned and identifies each cause can be changed to a different number for your needs.
5) Click "Write Data" to send the B-channel settings to the Multi-Cell.

Call clearing causes – In this table you have 16 call clear causes, in which you can change the number of cause to suit your needs.

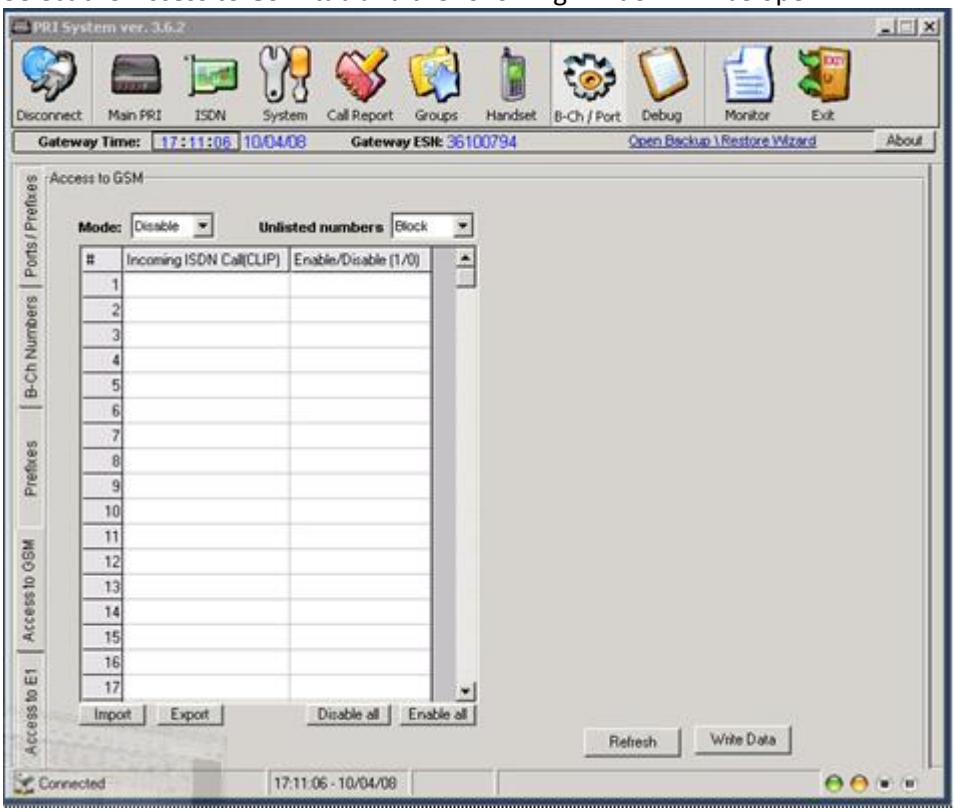
Auto Dialing to Multi-Cell PRI from reserved Port – The option to call a specific SIM in the Multi-Cell and have it call a predefined number; this feature is for test purposes. To use this feature, disable one or two ports in the "Ports/Prefixes" tab and assign "RESERVED1" AND "RESERVED2" to those ports. In the "B-Ch Numbers" tab, enter phone number to be dialed in "Reserved Port 1" and "Reserved Port 2". When a

call is made to the SIM in one of the reserved ports, the SIM in the Multi-Cell calls the phone number that is assigned in the RESERVED field.

10.1.2. ACCESS TO GSM & ACCESS TO E1

To access GSM:

1) Select the **Access to GSM** tab and the following window will be open:



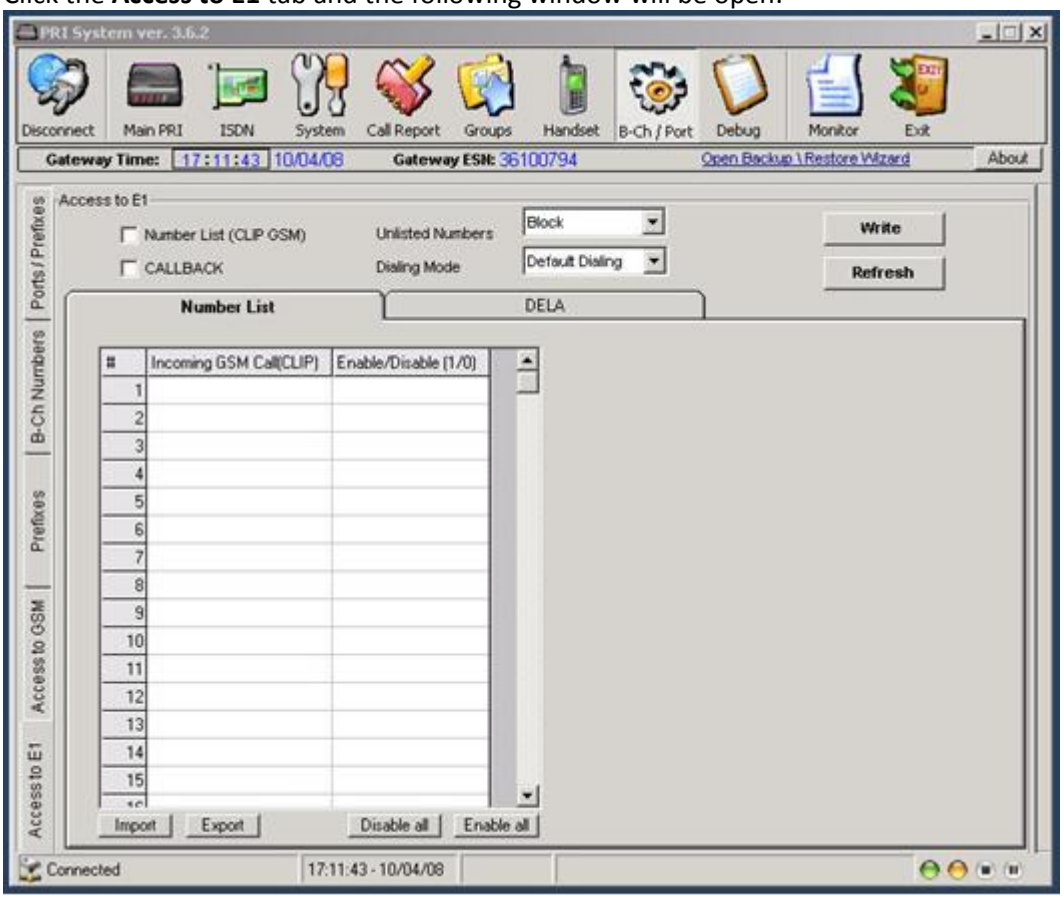
Use this table to permit or block access to cellular ports based on CLIP.

To use this table:

1) Enable it in the **Mode** menu
2) Enter the numbers to be effected in the **Incoming ISDN Call (CLIP)** column.
3) In the column **Enable/Disable (1/0)**, assign 1 to numbers that are permitted to access the cellular ports and 0 to the numbers that are not allowed to access the cellular ports.
4) In the **Unlisted Numbers** menu choose **Block** or **Pass** for numbers that are not in the list.
5) Click "Write Data" to send the changes to the Multi-Cell.

To access E1:

1) Click the **Access to E1** tab and the following window will be open:



Use this table to permit or block access to Multi-Cell PRI Interface based on CLIP.

To use this table:

1) Enable the "**Number List (CLIP GSM)**" box.
2) Enter the numbers to be effected in the **Incoming GSM Call (CLIP)** column.
3) In the column **Enable/Disable (1/0)**, assign 1 to numbers that are permitted to access Multi-Cell PRI Interface and 0 to the numbers that are not allowed to access the Multi-Cell PRI Interface.
4) In the **Unlisted Numbers** menu choose **Block** or **Pass** for numbers that are not in the list.
5) In **Dialing Mode** menu choose the option "Default Dialing".

Note: The features: **Dialing Call** and **CALLBACK** are optional, contact Eurotech for further information on these features.

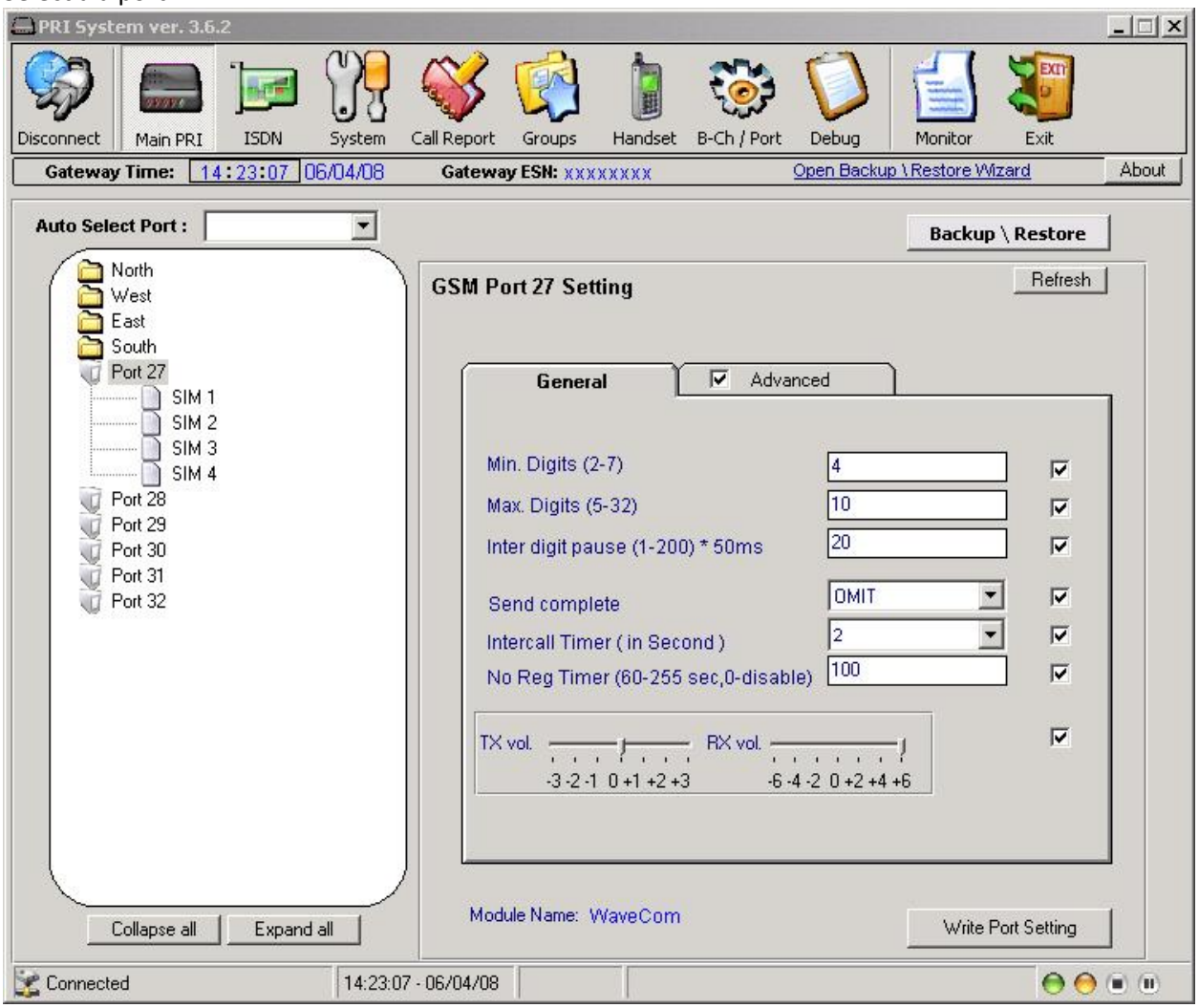
---

6) Click "**Write Data**" to send the changes to the Multi-Cell.

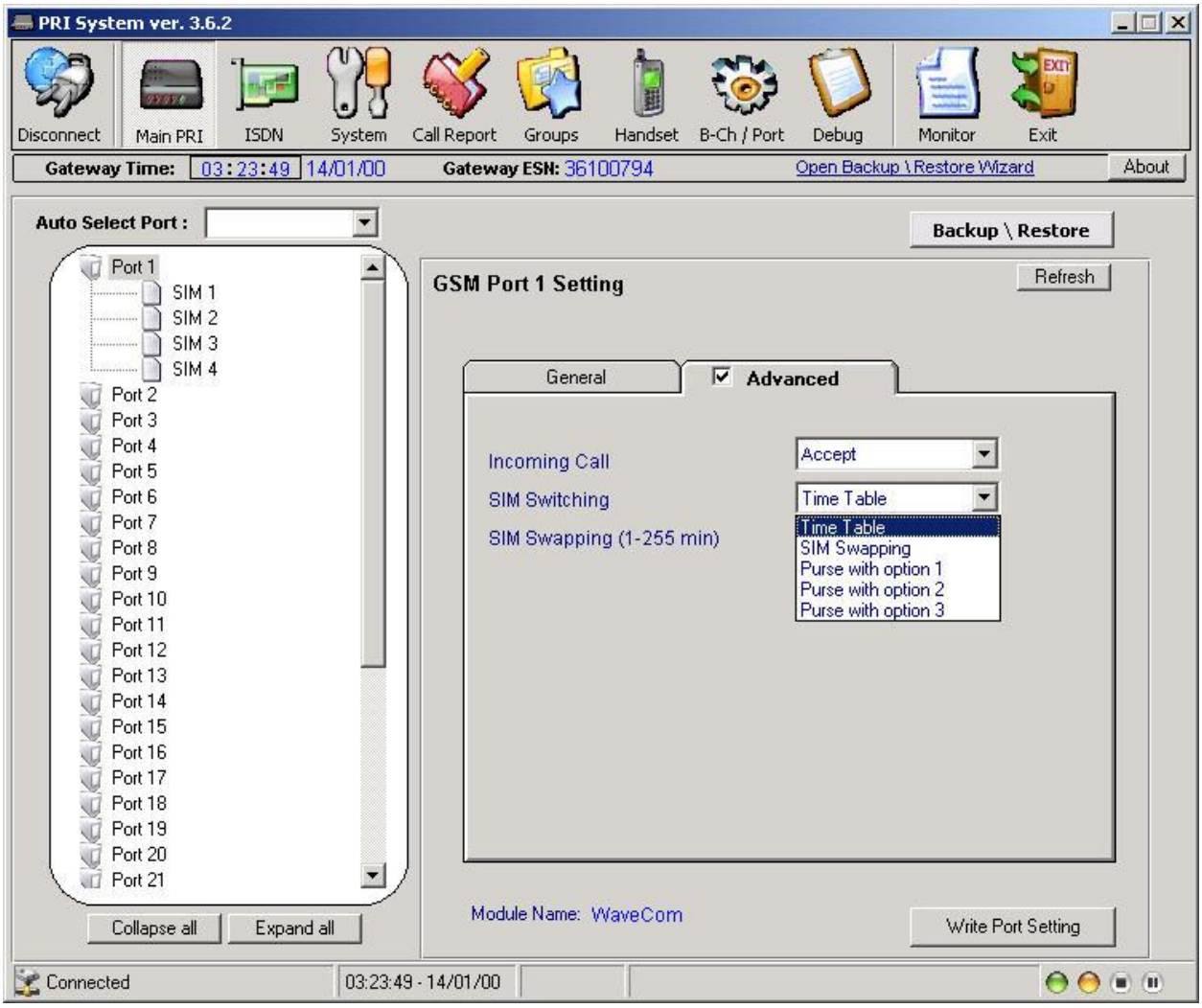
10.2. DEFINING THE WORK MODE FOR PORTS

To define the Work Mode for ports:

1) On the Main Toolbar, click **Main PRI.** The Port Setting window opens.
2) Select a a port.



3) Select the Advanced tab.



4) Define the following:

- **Incoming Call -** Accept or Reject incoming calls to the port.
- **Purse With Option 1,2,3** – All options works the same in the way that the port starts with the SIM that has the least amount of units, after all the units in this SIM end, the port moves to the next SIM which originally had the second least amount of units and so on, until it finishes all units in the 4 SIMs of the port

SIM Switching

- **Time Table** – The option for the port to work according to days and hours set for the SIMs.

SIM Swapping - There are now 4 options for SIM swapping as following:

- **Time limit -** The time limit can be set between 0-255 min

Or

- **Call limit -** The call limit can be set between 0-255 calls
- **Use of Time limit + Call limit -** If one of the parameters is set to Zero it will work according to the parameter with a value.
  If 2 values are set, then it will swap when one of the 2 parameters is reached.

Anti Block - The operators usually check by a certain amount of calls in a specific period of time.

For example:

In 20 Min less than 5 calls then the SIM will continue to work

If 5calls ≥ then SIM stops working.

Continue	Continue	deactivate SIM after 5 calls		SIM activated
4 calls	3 calls	5 calls	Time count till registration	
20 min	20 min	7min => 13 min 20 min		20 min

20 min

The SIM activates **only** after the counter has passed the allocated time, i.e. 5 calls made in 7 Min out of 20 Min the SIM deactivates, the SIM activate after 13 min, **this is for a single SIM.**

If using **4 SIMs/port** the next SIM will activate immediately with deactivation of the current SIM. The deactivated SIM will be ready for use only after time count of min for the SIM is concluded

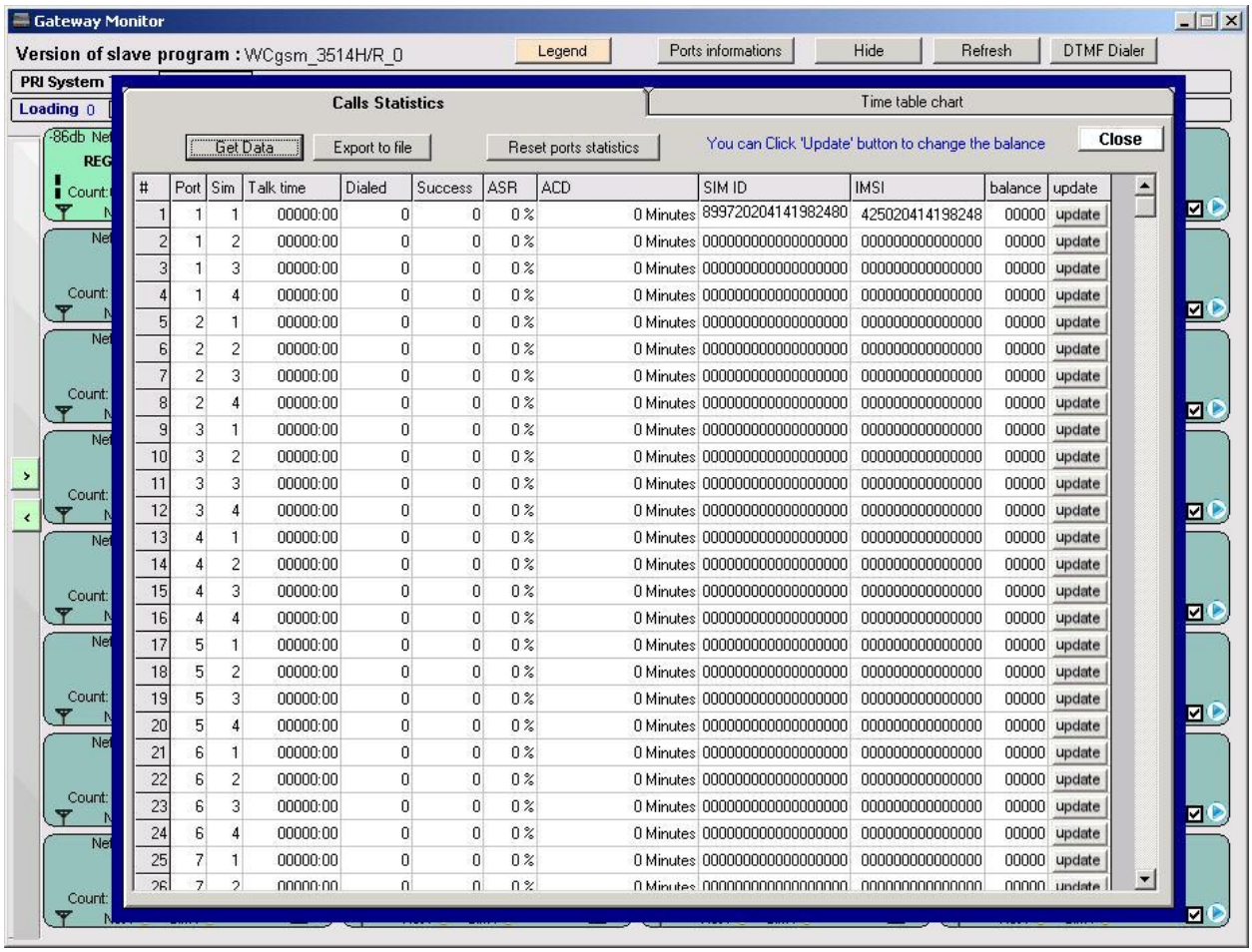
Difference between Purse Options 1, 2, 3 (port setting):

- Option 1: After all units in the 4 SIMs are processed, the port becomes inactive.
- Option 2: After all units in 4 SIMs are processed, the port moves to SIM 1 and all the calls will be managed through SIM 1.
- Option 3: After all units in 4 SIMs are processed, the 4 SIMs are recharging according to the setting in "Periodic SIM - recharge value".

After making port settings, make sure the box **Advanced** is checked and click **Write Port Setting** to send the settings to the Multi-Cell unit.

When using **SIM Switching: Purse with option 1, Purse with option 2 or Purse with option 3**, you have to set units for each SIM for the first time.

Click the **Monitor** icon, then click **Ports information** on the top left side, and then click **Get Data** in order to open the following window:



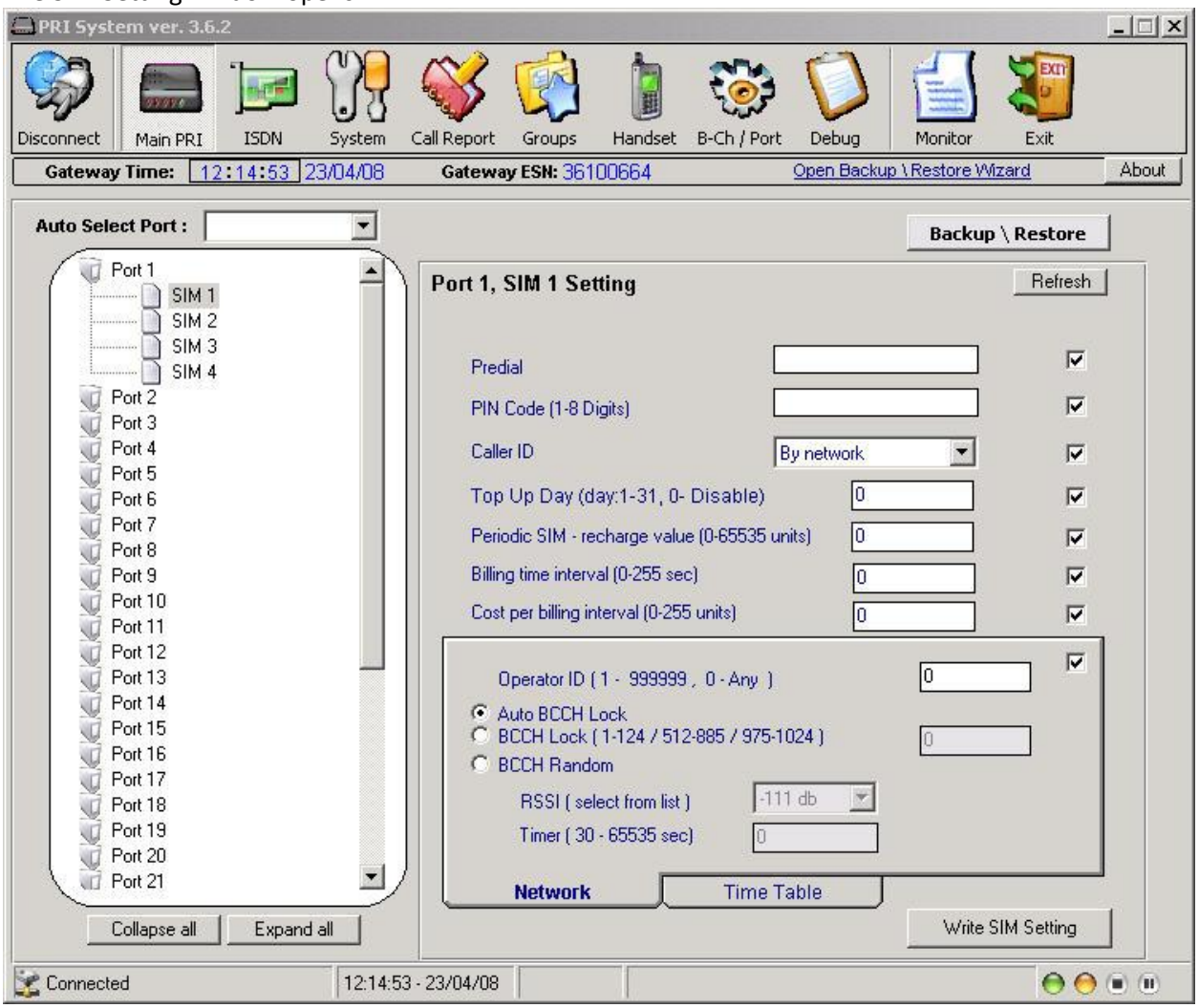
#	Port	Sim	Talk time	Dialed	Success	ASR	ACD	SIM ID	IMSI	balance	update
1	1	1	00000:00	0	0	0 %	0 Minutes	89972020414198248O	425020414198248	00000	update
2	1	2	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
3	1	3	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
4	1	4	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
5	2	1	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
6	2	2	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
7	2	3	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
8	2	4	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
9	3	1	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
10	3	2	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
11	3	3	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
12	3	4	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
13	4	1	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
14	4	2	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
15	4	3	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
16	4	4	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
17	5	1	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
18	5	2	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
19	5	3	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
20	5	4	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
21	6	1	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
22	6	2	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
23	6	3	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
24	6	4	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
25	7	1	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update
26	7	2	00000:00	0	0	0 %	0 Minutes	00000000000000000	000000000000000	00000	update

On the left side of the screen are the ports and SIM numbers. On the right side in the "balance" column, you need to enter the units you want for each SIM, them click **update** button.

10.3. CONFIGURING SIM CARD SETTINGS

To define settings for a SIM:

1) On the Main Toolbar, click Main PRI.
2) Select a Port and SIM.
   The SIM Setting window opens.



3) Enter a **pre-dialing number** for the specific SIM.
4) In **PIN CODE**, enter the PIN code of the SIM.
5) In **Caller ID**, select a caller identification option:
   - To enable the cellular network to set caller ID standards, select "By network".
   - To disable identification of the SIM, select "CLIR Hide".
   - To enable identification of the SIM, select "CLIR Show".
6) In **Top Up Day,** define a day in the month when the Multi-Cell adds the units that you set in "Periodic SIM - recharge value (0 - 65535 units)".
7) In **Periodic SIM,** define the recharge value (0-65535 units): Amount of units you wish to add according to the **Top Up Day** or if you chose the option **Purse with option 3**.

8) In **Billing Time Interval (0-255 sec)**, define how many seconds equals one unit (or a few units) according to SIM tariff.
9) In **Cost Per Billing Interval** (0-255 units), define the cost per unit/s.
10) Click **Refresh**.

10.3.1. DEFINING THE TYPE OF CHANNEL AND OPERATION LOCK

To define the type of channel and operator lock:

1) On the Main Toolbar, click Main PRI.
2) Select a Port and SIM.
3) Click the **Network tab**.
4) In **Operator ID (1 – 999999 , 0 – Any),** enter the operator ID that you want to lock the SIM to.
5) Select from the following options:
   - To lock a SIM to the channel with the strongest signal, Select Auto BCCH Lock. If many SIMs are at this setting, the strongest channel may become overloaded.
   - To permanently assign the SIM to a channel, select BCCH Lock, and enter a channel number between 1 - 251, 512 - 1023 (inclusive).
   - To rotate the channel, select BCCH Random, and set the following parameters:

     Select the minimum reception for a channel lock in the RSSI box.

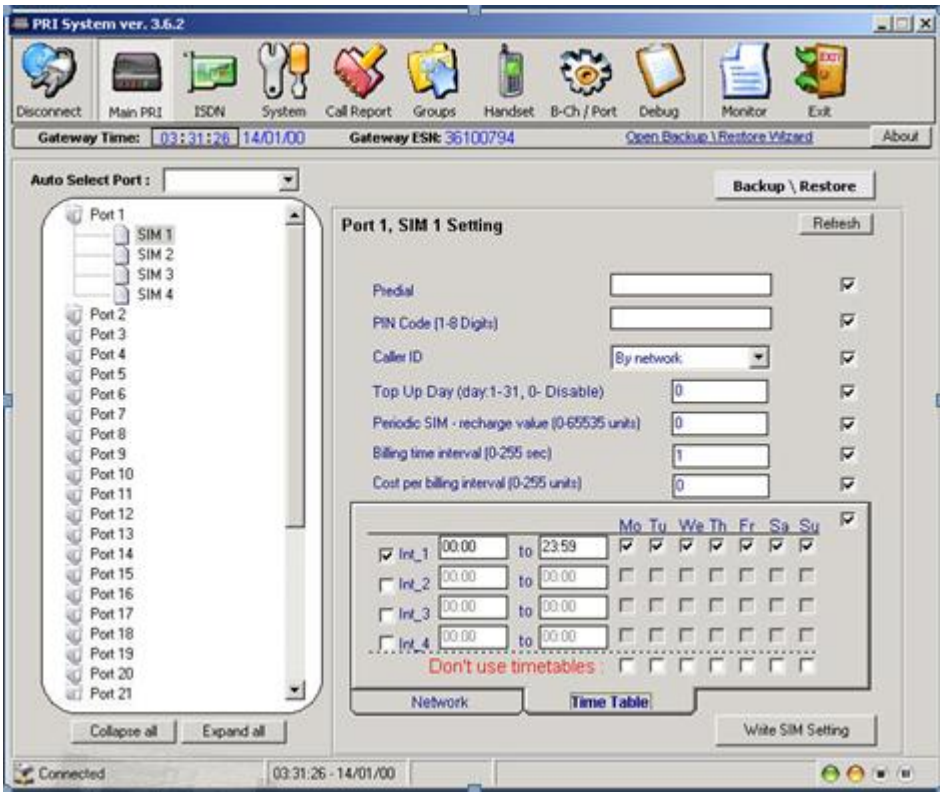
     At Timer, select a time limit that the SIM is locked to a channel. Select between 30 - 65535 seconds.
6) Click **Write Settings** to send the settings to the Multi-Cell Gateway.

10.3.2. SETTING TIME TABLE FOR SIM

To set Time Table for a SIM:

1) On the Main Toolbar, click Main PRI.

2) Select a Port and SIM.
3) Click the **Time Table** tab.

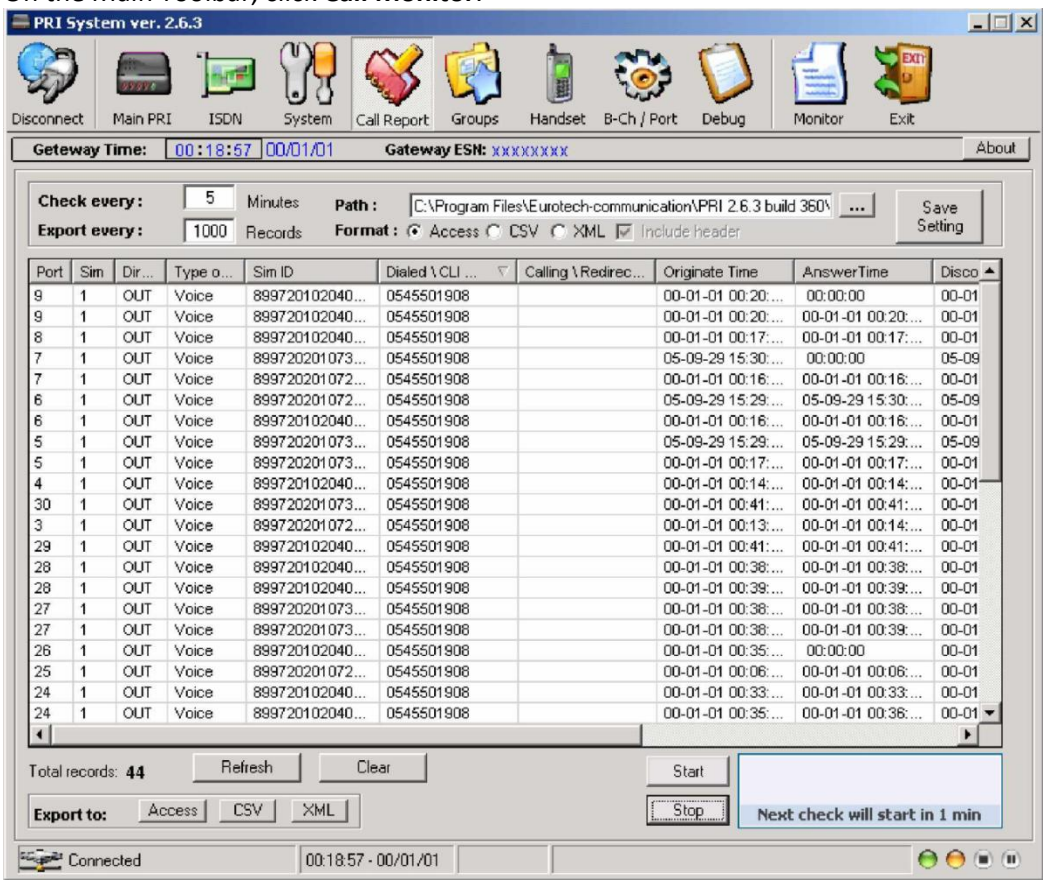


4) Define days and hours that the SIM is active. Days can be divided in up to four intervals.
   a. Select an interval.
   b. Enter the hours of the interval.
   c. Select days that this interval will be activated. Select days of deactivation in the row"Don't use timetable".
5) Click **Write SIM Settings**.

11. GENERATING CALL REPORTS

To review Call Reports:

1) On the Main Toolbar, click **Call Monitor**.



This screen defines the parameters for a successful or unsuccessful call. The system may store about 250000 CDRs without a PC. The system may **export these reports to MS-Access, CSV (MS-Excel) or standard XML format.**

2) In the "**Path:**" field, enter the path that you want to save the CDRs in.
The export of call records will be time based; the time is set in "**Check every X minutes**" field. It may be done automatically and may be set in the "**Export every X records**" field. If you choose not to download the CDRs by time, you should enter **0** in the "**Check every X minutes**" field.

3) After changing one of the above fields, you have to click the "**Save Setting**" button on the upper right side.

Note: When the CDRs are being downloaded, they are actually erased from the unit!

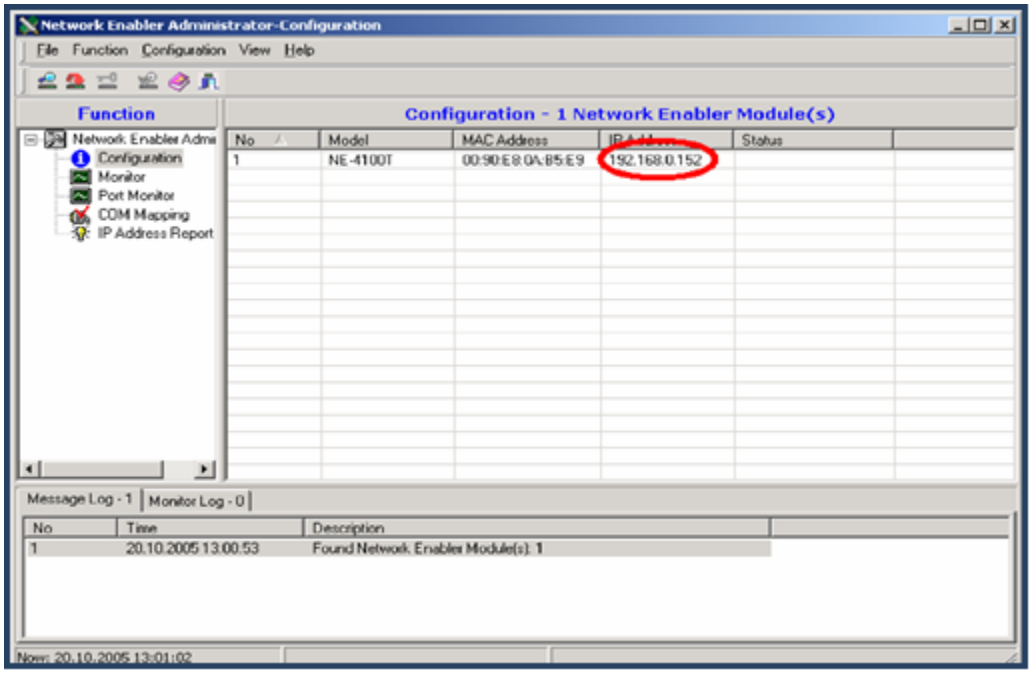
Manual command to export files of CDR to PC can be done in the following format: Access, CVS (Excel) or XML.

Click the START Button on the lower right side to start downloading the CDRs; after the CDRs are downloaded, choose the format that you want to save the CDRs, in the "**export to:**" box, on the lower left side.

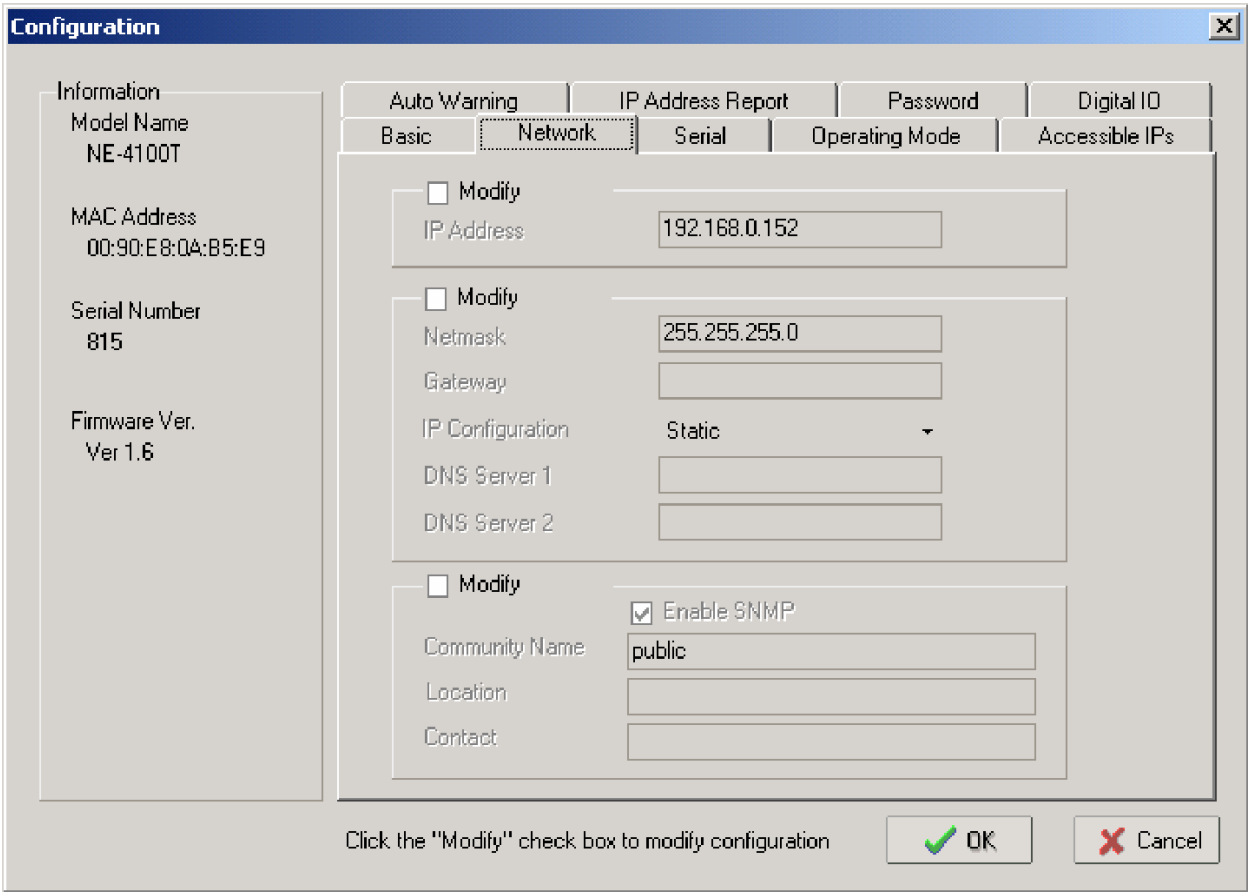
12. TCP/IP SETTING

To define TCP/IP settings:

1) Disconnect the COM cable from the Multi-Cell system.
2) Connect the Multi-Cell to your LAN via the NETWORK connector in the master board.
3) Install the software "Network Enabler Administrator" which is provided on the installation CD at the directory "LAN Tools".
4) Launch the software "Network Enabler" and click the **SEARCH** icon (upper left side) to find the Multi-Cell's IP.
5) The Multi-Cell's IP should appear in the next screen:



6) Double click on the IP, then select the Network tab. The next screen will open:



7) Enable the "**Modify**" check box above the IP Address and enter the desired IP,
8) Click "Modify" below to change "Netmask" and other settings.
9) Click **OK** .

13. TROUBLESHOOTING AND KNOWN ISSUES

The following are main debugging tools which are very useful to overcome connection problems:

- The RJ-11 handset.
- The PRI Management Debug Window.

WARNINGS!

The call is NOT FREE and will be charged from the SIM registered billing account, by your cellular supplier!

You must press "Disable Handset" button to exit from the test mode and have the Multi-Cell back in normal operation mode.

13.1. THE RJ-11 HANDSET

- ***To use a handset test:***

1) On the Main Toolbar, click **Handset**.
2) Click **Enable Handset**.
3) Check the connections with the handset RJ-11 and the HS-Slot in the Multi-Cell PRI system are properly connected.

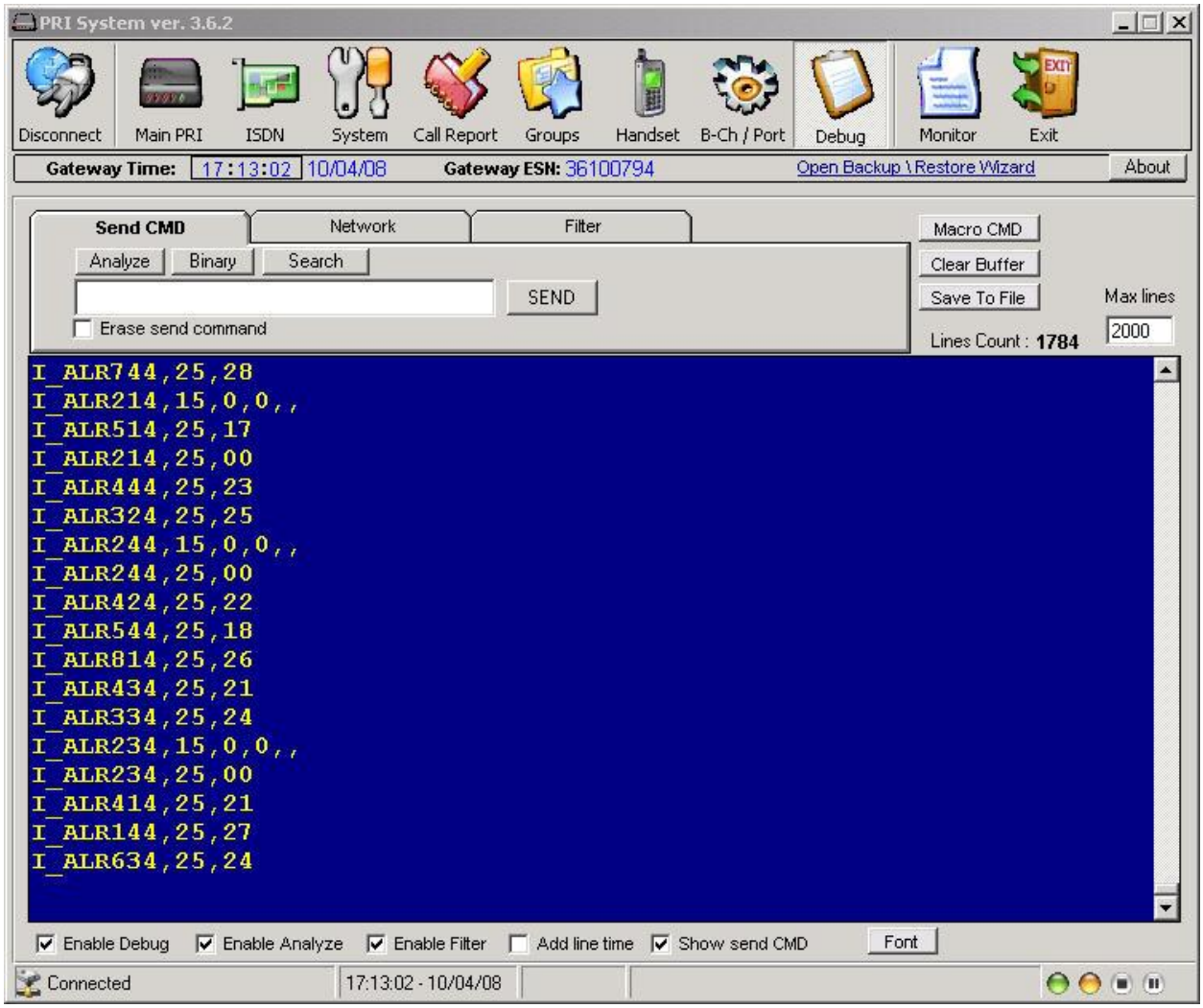
Note: The handset test may be used to check any of the 32 ports in the unit and it bypasses the equipment connected to the Multi-Cell.

4) After finishing testing in handset mode, you must click "Disable Handset" button in order to exit from the test mode and have the Multi-Cell back in normal operation mode, otherwise the unit will not be able to process any ISDN calls.

13.2. THE MANAGEMENT APPLICATION DEBUG WINDOW

Note: Use this only when in contact with a support technician.

To open the Debug screen, on the Main Toolbar, click Debug. The Debug window opens.



14. FAQ

There are several common problems and solution we have collected to share with you as follow:

Q.: I'm trying to connect to the Multi-Cell via LAN, with the PRI Management Application, but I keep getting an error message. How can I resolve this?

A.: Unhook the COM cable from the Multi-Cell and reboot it. Now try to connect the PRI Management Application using the TCP/IP connection.

If reboot is unwanted, connect to the Multi-Cell via COM cable with PRI ManagementPRI Management Application, go to the system screen and perform the actions described below:

1) On the Main Toolbar, click System.
2) Click **TCP/IP**. The system will be in TCP/IP communication mode between the auxiliary computer and the Multi-Cell unit.
3) Disconnect from the COM connection and reconnect using TCP/IP connection; if the problem persists, contact our support.

Q.: I've made some calls, with the handset, the Multi-Cell worked perfectly, but now, as I connect the Multi-Cell to my PBX, the calls are not going through. How can I resolve this?

A.: Check that you have disabled the handset test mode after finishing with the test calls. If the Multi-Cell is in "Handset Mode", it means that the communication on the ISDN line is disabled and the only open voice channel is set for the handset.

Q.: Can I use the handset to make calls directly from the Multi-Cell PRI Gateway? For example refill the account of my SIM cards.

A.: It's doable, but be advised, that all of the ongoing calls will be disconnected, the second you login to the handset mode, and all of the incoming calls will be rejected, until you logout from the handset mode.

Q.: I've got too many cables with the Multi-Cell, which cables do I really need to use?

A.: There are five connection cables and one power cable, supplied with the Multi-Cell PRI Gateway package:

- RS232/RJ11 (COM) cable for connecting the Multi-Cell to an auxiliary computer (PC).
- Two RJ-45 straight cables, one for the Ethernet LAN connection and the other for the ISDN connection (in case the Multi-Cell is set to TE Network Access).
- An Ethernet RJ-45 cross cable used for direct IP connection between the Multi-Cell and a PC, in order to set the initial IP settings of the Multi-Cell Gateway system.
- An E1 RJ-45 cross cable, is used for ISDN connection, in case the Multi-Cell is set to NT network access mode.

Q.: I've connected the Multi-Cell to my VoIP gateway, but calls aren't going through the Gateway. How can I resolve this?

A.: Check the connection between the VoIP and the Multi-Cell. The VoIP should be set to master synchronization and NT network access and the Multi-Cell should be set to slave synchronization and TE network access. Note that the ISDN cable connecting the Multi-Cell and VoIP should be straight, not

cross. Although, check that the calls are sent to the Multi-Cell from VoIP as "voice", any other setting will result in call rejections.

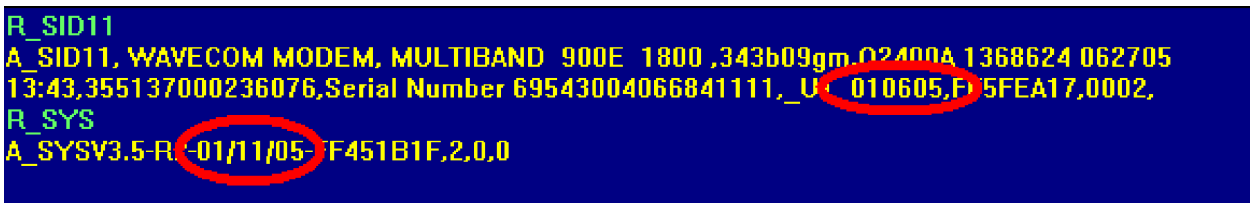
Q.: I am trying to connect to a Gatekeeper with my VoIP Gateway and I cannot pass call through it. How can I resolve this?

A.: This is out of this manual scope and we cannot help you with that, since it is specific VoIP equipment. Contact your VoIP equipment support to resolve this problem.

Q.: How can I check my Multi-Cell's firmware?

A.: Connect to the Multi-Cell, using the PRI Management Application. Go to the "**Debug**" screen. Check the "**Enable Debug**" check box; uncheck the "**Enable filter**" checkbox. At the field, near the "**SEND**" button, enter **R_SID11** and click **enter**.

Two rows will be the feedback. At the same field enter **R_SYS** and click **enter**. One row of feedback will be shown. Uncheck the "**Enable Debug**" checkbox. You should get something like the following text message:



The first circled value is the slave's firmware version the second value is the master's firmware version.

Q.: I have disconnected calls from the GSM with cause number 50, what is the reason for that?

A.: In the Multi-Cell PRI PC software, in SIM setting the option "CLIR Hide" is chosen or the "Predial" field has the digits to hide the called number. If the SIM does not support this option then the operator will block the call. You should choose "By network" and make sure the field "Predial" is empty.